THE VETERINARY RECORD

A Weekly Journal for the Profession.

No. 969. FEBRUARY 2, 1907. VOL. XIX

BLOOD-SERUM THERAPY.

It is rather surprising how little we hear of the practical application of this much studied division of therapeutics.

In veterinary practice there is some evidence that Tetanus can be prevented by a properly prepared serum, but there is no evidence that the material has any curative action. In Black-quarter there must exist a vast quantity of experience as to the value of more than one vaunted preventive; but very seldom are any facts given to the profession by those having the ability.

Immunisation against disease seems so near attainment in many cases that one almost becomes impatient at the delay in obtaining trustworthy curative sera.

Possibly the new Opsonic theory may help forward the realization of our wishes, but the method is difficult of application. In our report of the meeting of the Liverpool University V.M. Society, Professor Annett gives a paper explaining the theory, and tabulating a number of cases in the human subject. Towards the end of the paper is this paragraph:—"The method of procedure in such cases would be simple. From the lesion, first, one isolates the causal organism, and after cultivation the serum of the case is tested as to its opsonic power in respect to the micro-organism thus isolated. Then the inoculation of a small amonnt of a killed culture of the organism must be followed by further observations of the effect produced thereby on the opsonic index," and so on.

We rather fail to see the *simplicity* of this proceeding, besides which it must occupy some time and entail considerable expense. There are many cases of valuable animals in which neither the expense nor the time would be considered, but when sera can be kept in stock we shall look for their more common use. When they have to be specially manufactured for each case we fear this will be confined to places where a bacteriological laboratory is close at hand. The two cases quoted by Dr. Annett from a report by Mr. Godber do not seem to prove much. Recoveries in the same time have been witnessed when no injections were used.

We hope all our readers will understand what "the opsonic index (taking an average of 30 W.B.C.) was found to be 3·6" means.

ALBINISM.

A correspondent who is studying albinism wishes to obtain some eyeballs from "wall-eyed" animals—horse, dog, sheep, or any other species—and will be greatly obliged to anyone who can send him such. The eyeballs should be removed immediately, or very soon, after death, and placed at once, *without being opened*, in a large bulk of 10 per cent. solution of Formalin. After a few days in this fluid they may be packed in cotton wool soaked in the same solution, covered with a waterproof material, and sent in a box by post with name and address of sender to: E. Nettleship, M.R.C.V.S. F.R.C.S., Hindhead, Haslemere, Surrey, who will defray all expenses to which the sender has been put.

HOW DISEASE IS SPREAD.

By W. HUNTING, F.R.C.V.S.*

I have thought it better, in this opening address, to devote my time to one subject rather than to a review of the past work of the College, or to the expression of pious hopes for the future of agriculture, or even to the advantages offered to students at the R.A.C.

I have selected the subject of "How disease is spread" because I think it is one of interest to men who are or may be owners of stock; and because it is one of the few agricultural topics about which I know anything.

When we remember that the prevention of animal plagues can only be successfully and economically accomplished by enforcing regulations founded on a knowledge of the origin and transmission of disease, we see at once the importance of answering the question—How is disease spread?

Unfortunately we cannot fully answer it, and our very ignorance is a strong reason for recognising its gravity and the need for research thereon.

There are diseases due to accidents, to poisons, to errors of feeding and ventilation, but they cease with the death or recovery of the animal affected—they do not spread. There are diseases which arise from no apparent cause but which are attended by certain specific symptoms, and which pass from animal to animal giving rise to similar symptoms and lesions—they are transmissible. For at least three thousand years this division of diseases, into those which spread and those which do not, has been recognised to some extent. Leprosy was legislated for by Moses. The Greeks have left us accounts of plagues, affecting men and animals, which they knew were "catching." Some early attempts were made to stay the progress of plagues by isolation of the affected, but it was not till last century that any real knowledge of contagious disease was obtained. Fifty years ago, although a number of diseases were recognised as transmissible the general idea was that some volatile emanation passed from the diseased to the healthy animal, and that spread depended upon climatic or atmospheric causes. In those days the spontaneous generation of living things was generally accepted, and the majority of people were satisfied that even such complex organisms as maggots were produced from putrefying substances.

It was not till Pasteur published his researches showing that life only came from life, and when Chauveaux demonstrated that the active cause of

* Address at the opening of Session, Royal Agric. Coll., Cirencester, on Friday, Feb. 1st.

disease was not volatile but particulate, that truer ideas of the nature of contagion became accepted. Observation had shown that diseases of man such as small-pox, measles, and scarlet-fever were easily spread, and that some diseases of animals such as glanders, influenza, and foot-and-mouth disease were transmitted, but even in the middle of last century few denied that these diseases might arise *de novo* and then becomes contagious.

Until the invasion of England by the cattle-plague in 1865 only the haziest notions about the spread of disease existed, both among human and veterinary pathologists. Nothing was known of microbes as the cause of disease, but recognition had been made of a poison or virus in the system of infected animals. It was known that the pustules of small-pox and sheep-pox contained a poison capable of reproducing the disease by inoculation. It was known that the saliva of a rabid dog when carried by the teeth into a wound was capable of transmitting disease. In some diseases the blood, the juices of organs, or even the excretions and secretions were known to possess infective properties. These facts went to demonstrate the presence of a poison—of a poison capable of growth and multiplication, therefore of a living poison. Even when certain diseases were acknowledged to be due to a living virus, time was required to obtain credence for the explanation that each specific disease must be due to a specific virus. The mysterious and sudden appearance of a contagious disease seemed inexplicable except under the assumption of a spontaneous origin, or carriage through the air over long distances. It was pointed out that these diseases arose under the most diverse conditions of place and circumstance, that when one case appeared others followed, that every case presented more or less the same symptoms and lesions, that tolerably definite periods elapsed after infection before signs of disease appeared—in other words that the poison after entering the system required some time for incubation. All of which pointed to the effects of a definite living object.

Then came the time when Kock published his discoveries of organisms which he had detected by the microscope, which he separated, cultivated and injected into healthy animals, with the result that the same disease arose as in the animals from which he had obtained the original microbe. From this time much good work has been done, and we possess now a mass of facts which permit practical deductions to be drawn as to how to control disease—modifying some, exterminating others.

Bacteriologists have not yet discovered all specific microbes which cause disease. The size of the bacteria is one reason for this. The larger organisms could be detected with microscopes of low power, and the anthrax bacillus was well recognised before its virulent properties were known. There are a number of diseases which we all agree are contagious—and therefore almost certainly microbian in origin – but in which no specific organism has been detected, for the simple reason that our best microscopes do not magnify sufficiently to disclose the causal object. The virulent fluids of such diseases as rabies, small-pox, canine distemper and swine-fever will produce disease when inoculated, even after passage through a porcelain filter which removes from the fluids all visible particles.

That there should be gradations in size of bacteria is what might be expected and what is found. From the large organisms of anthrax we descend through regular stages to those of tuberculosis, glanders, and tetanus, till we reach that of pleuro-pneumonia, when we come to an object so small that only great care and the highest magnifying powers enable formless specks to be detected.

Some of these disease-producing microbes appear to have no existence outside of the species of animal they infect. Others possess the power to live outside of the animal body only for a limited period. Whilst a third variety live, develope and multiply indefinitely outside an animal body—as for instance the organisms which cause tetanus, anthrax, black-quarter, and louping-ill.

The knowledge we require concerning these microbes is—how and where they live, how they develop and multiply, how they pass from diseased to healthy animals, and what conditions facilitate or retard their vitality. These are the questions engaging the attention of scientific men all the world over, and answers to the questions are being afforded with most encouraging frequence.

When we meet with an outbreak of disease our first enquiry is—What is the cause and where did it come from? If we are acquainted with the symptoms of disease we attempt to classify it. If it is a contagious disease we endeavour to trace its origin back to an infected animal or to some place or thing which has been infected by a diseased animal. In a few cases this is easy. Swine fever appears in a newly purchased pig, usually the first to show signs of the disease. Glanders is first noticed in a newly purchased horse, probably bought in London. Distemper breaks out in a kennel shortly after the introduction of a new dog. From these infected animals the disease spreads, and no difficulty is experienced in tracing the cause to its origin. But in many cases it is not so easy to find where the infection came from. When rabies was prevalent owners of an infected dog would often assure you that the patient had never been bitten by another dog. This only meant that they saw no bite. A rabid dog might pass just at the moment a pet dog was allowed out for a run, bite his victim and pass on leaving no trace behind him. In the days of the cattle plague an outbreak occurred at Wolverhampton on the premises of a man who only had two cows. No other cow had been on the premises for months. The owner's son was a butcher and had been engaged slaughtering diseased cattle in Cheshire for the Government. The disease appeared a few days after his return, and doubtless because he carried with him the causal organisms. Four horses stabled in a London mews had not been in contact with other horses for years. One of them developed symptoms of glanders and was destroyed. The other three lived for years and showed no sign of disease. No such disease had been known in the mews for 20 years. The method

of infection was a mystery until, many months after the attack, it was discovered that a very virulent and fatal outbreak of the disease had existed at a livery stable eight miles from London, and that the London horse had been temporarily stabled there when its owner paid a weekly visit to the little town. It did not come in contact with diseased horses, but it ate from the infected manger of the stable.

The infective material may pass direct from a diseased to a healthy animal, it may be left in mangers or water troughs, on clothes of men, or it may be conveyed by a convalescent animal showing no sign of disease, as in cases where infection is spread by horses that have recovered from strangles, or by dogs that have passed safely through an attack of distemper. Perhaps the most dangerous carrier of disease is the animal suffering from one of those contagious maladies that run a slow course—a course in which no external signs of disease are apparent for a time, but in which the causal organism is actively living and developing in some organ from which it may occasionally escape. We have this latent form of disease in pleuro-pneumonia, glanders, tuberculosis, and swine fever. Such an animal is too often an unsuspected centre from which infection proceeds. It may itself survive for a long time whilst other animals around it are fatally attacked. When pleuro-pneumonia prevailed in this country many an outbreak was traceable to an apparently healthy animal, and heavy loss was often incurred before the latent disease was suspected. When "pleuro" was stamped out by the slaughter of all diseased animals and all the bovine in-contacts these latent cases were disclosed on post-mortem examination. They were not diagnosable in any other way, and their insidious conveyance of disease could not have been prevented except by the drastic method of slaughtering the whole herd when one case of disease had been discovered.

Swine fever is a disease the Board of Agriculture has been expending its energies on for years. It is one of the diseases which may have a latent existence for no one knows how long. The Board has not been successful, and it seems improbable that it ever will be so long as latent cases of disease escape slaughter, as they now may. Glanders in horses is another disease which in almost every case has a period of latency during which no sign of disease is visible, but which may develop suddenly in a positive infective condition. The whole spread of the disease from stable to stable is traceable to the sale and purchase of horses suffering from this latent form of disease. Aud yet in face of this well known fact no legislation provides for the detection and detention, let alone slaughter, of these dangerously infected animals.

Tuberculosis is another plague which in most cases has a period of latent development during which the infected animal may pass from farm to farm, or shed to shed, carrying with it the potentiality of infection. When this disease is scheduled, as I hope it soon will be, no regulations will be of much use which do not recognise the special danger of the latent stage.

The causal organism—the specific microbe of disease—must escape from a diseased animal before it can enter the body of a healthy one. It may escape during the life of its victim, from the mouth as in tuberculosis, from the nose as in glanders, from the intestines as in swine fever, from the generative organs as in contagious abortion and in dourine, from the skin as in sheep-pox, with the saliva as in rabies, or with the blood as in anthrax. It may be carried by blood-sucking insects, and in some diseases it may be left on the stalls, walls, or mangers of the place where the animal was housed. It may perish shortly after death of the infected animal, or it may remain in certain fluids and tissues active and virulent for a time. It may cease to be dangerous on the death of its victim. We know, thanks to the observations of the late Sir George Brown, that on the death and removal of animals affected with pleuro-pneumonia, healthy cattle may be placed at once in the sheds where diseased animals died and yet no infection take place. The microbe did not die with the animal, it was unable to escape from the carcase.

In yellow fever of man a similar observation has been made. During life the patient is dangerous because a blood-sucking fly may remove the germ and carry it. After death the fly ceases to attack, and the cadaver is not infectious. A very practical value was shown to be attached to this knowledge in the outbreak at New Orleans two years ago. So afraid of the dead body were the authorities that a special cemetery was established for yellow fever victims at great expense. Cost of this kind is now known to be unnecessary.

Knowledge of the vitality of the infective germ outside of a diseased animal is of great importance. How long, for instance, may the microbe of swine fever, of glanders, or of tuberculosis, remain infective in water troughs or mangers. Probably not so long as is generally imagined, because it is destroyed by sunlight, by dessication, and by the bacteria of putrefaction. In those cases where the microbe possesses the function of sporulation, as in anthrax and tuberculosis, the spores are less easily destroyed, and therefore it is essential that every means be taken to prevent the germ or spore from remaining vital and dangerous. Hence the importance of cleansing and disinfecting all places or things on which infective microbes may be deposited.

Disease producing microbes may pass from infected to healthy animals either directly or indirectly, and they may, as in the case of anthrax, quarter-ill, tetanus, and some other diseases, pass from their natural habitat—the soil—to the healthy animal. But every infected animal is a possible source of re-infection of the soil, so care should be taken that infected carcases, or hides, or hair, or bones should not be so disposed of as to add to the natural danger of the field or place in which the animal died.

The next important question is, How do disease producing germs obtain access to the system of healthy animals? In three ways:—

By Ingestion,
Inhalation,
Inoculation.

Ingestion, i.e. taken in by swallowing, is undoubtedly a very common method of invasion. Experiment has shown that the virus of glanders and tuberculosis when swallowed with food or water is capable of causing disease. The spread of typhoid and scarlet fever through milk or water has been frequently demonstrated. Prof. Hamilton has recently shown that braxy and louping-ill are spread by ingestion. In anthrax and black-quarter the usual method of infection is by way of the digestive organs, although both may be transmitted by inoculation.

There are probably very few contagious diseases that may not be spread by ingestion of their specific microbes. Bang has shown that contagious abortion may be spread in this manner, and there seems clinical evidence that influenza and strangles may be transmitted by means of infected food to healthy horses.

Ingestion does not receive the notice it is worthy of as a method by which disease enters the animal body, whereas inhalation occupies too much attention. Ingestion can be guarded against, and preventive precautions taken much more effectually than in the case of inhalation. If diseased animals can foul their food and mangers, their pails and nose bags, or even large portions of the sheds and stables in which they stand, it is of the first importance to see that such infection is not allowed to spread by the infected material being ingested by healthy animals.

In the case of glanders in horses the diseased animal invariably infects the food in his manger and nosebag, and such food may carry infection for a fortnight or perhaps for a month. It is, then, of supreme importance to guard against any food left by a glandered horse being given to a healthy one, and of nearly equal importance that the mangers, pails and other receptacles should be thoroughly cleansed and disinfected.

In the case of tuberculosis in a cowshed the same precautions are as urgently necessary. The cow with diseased lungs and open lesions has usually a cough. Mucus laden with active germs, mixed with saliva and portions of food, is forcibly ejected into the manger, upon the wall in front of the animal, and directly on to the food of the neighbouring cow. This is allowed to go on without a care, whilst precautions are taken to ventilate the place and prevent aerial carriage of dried germs.

Human hygiene seems to me to show the same negligence. Whilst spitting on a pavement is forbidden lest a stray germ, when it becomes dry, be carried in the air to a healthy passer by, whilst open windows are insisted upon and phthisical patients advised to sleep on the roof or in the veranda, a consumptive mother may give her children the half consumed jellies, fruits or sweets which she has no further appetite for. I hold very strongly that ingestion as a method of infection does not obtain all the attention it is entitled to.

Inhalation, i.e., taking in with the breath or the passage of microbes with the air into the respiratory tract and so reaching the lungs, is another method by which disease may be spread.

That minute particulate objects, such as dried germs or spores may pass to the lungs with the inspired air cannot be denied. There was a time when coal miners' lungs were often found black from inspired dust. Ventilation was so defective that the air of the mine was impregnated with fine dust. Nowadays "miner's lung" is seldom seen. Stone masons and cement workers also suffer from injured lungs due to the dust occasioned in their work. These extreme cases are supposed to demonstrate the possibility of disease germs reaching the lungs in the ordinary atmosphere of rooms and towns. The things compared are not analogous. In the cases of workmen mentioned the air around them is surcharged with fine particles, and they spend one third of their day exposed to it. Inhalation of disease was a plausible theory in the days when germs were not known and when disease was supposed to be volatile. Until quite recently malaria was believed to be a disease in which inhalation was certainly the method of infection, but we now know that it is spread entirely by the bite of a mosquito that has fed from the blood of a malarial patient. In tuberculosis of the lungs—phthisis—it used to be argued that as the lungs were the only part of the body primarily affected, and as they were directly exposed to the air through the wind pipe, it was natural to assume they were infected through the most direct channel. This argument is answered by facts. It is quite possible to produce tuberculosis of the lungs by ingestion or inoculation. In another disease—glanders—infection has never been induced by experimental inhalation, whilst ingestion never fails to infect the lungs whether or not other lesions are caused. Then experiments were made to directly test the ærial propagation of disease. Rabbits were put in boxes into which air charged with dried tubercle bacillus was forced and the rabbits became infected. This experiment was under conditions impossible during life outside a laboratory, and no experiment of the sort has ever been conducted which prevented the animals ingesting the dust as well as inhaling it. Inhalation draws air into the lungs through the nose, mouth, pharynx and larynx. All these passages are covered with mucus, and any particles entering with the air when they come in contact with this mucus are retained, unless, as in coal mines, the air is absolutely surcharged with the particles.

A sound mucous membrane is not easily penetrated by microbes. Dry microbes which have escaped the destructive effects of dessication and the action of sunlight cannot be very common in the air of even an infected place. In the air of streets or fields floating, living, disease producing microbes will be, comparatively as far apart as ships in the open ocean. Of all methods by which the microbes of disease enter animal bodies, inhalation is the least common and therefore the least to be feared.

Inoculation is the passage of the virus of disease through a wound of skin or mucous membrane, the poison then entering the system by the blood vessels or lymphatics.

There are probably no transmissible diseases

which cannot invade the animal system by this method of entrance.

Rabies is spread from one dog to another by biting. The saliva bears the disease, and the teeth inoculate the victim. There are cases on record where no bite has been inflicted, but in which the disease has been communicated to human beings through broken or injured skin by the dog having licked a sore. Outbreaks have been known to spread among herds of deer, which do not bite, but which when affected continuously lick each other so that the skin is sufficiently injured to permit inoculation. Rabies is one of the diseases with a long period of incubation. Our insular position has enabled us to stamp the disease out, and our regulations against imported dogs have left the country clear of rabies for some years. If we see the disease again it will only be through evasion of the law controlling importation.

Tetanus is not a contagious disease, but it is caused by a bacillus. The horse frequently saffers from tetanus, but no case has been known to proceed from horse to horse. The bacillus is found in soil; and no town horses are so subject to the disease as those working in dust yards. The tetanus bacillus exists in the intestines of horses which are quite healthy and may be found in the excrement. Wounds of the tail are often followed by an attack of tetanus, due to the infection of the wound by the bacillus which has harmlessly passed through the intestines. Wounds of the feet are frequently followed by tetanus, and of course the frequency is due to the fact that such wounds are most likely to permit of the introduction of the bacillus from the soil or surface of roads.

Malignant Œdema is a disease caused by a bacillus whose habitat is the soil. It is widely distributed, but not a cause of great fatality because it only enters the system through wounds. Some outbreaks of diseases in Australia were most obscure. All the sheep had the same surroundings and food. Many were seized with illness and died rapidly. It was noticed that only clipped sheep, and not all of them, were affected and naturally the loss of their protecting coat of wool seemed to have some influence. Close examination showed that all the sheep attacked had been accidentally cut with the shears, and thus a wound was made which gave entrance to the bacillus.

Anthrax is probably most often the cause of disease in cattle by ingestion. In man it usually invades the body by infection of a sore or through a cut on the skin. In this way butchers and labourers have lost their lives by skinning and cutting up the carcases of animals which have died of anthrax. In the case of wool-sorters disease—a form of anthrax—it is said that the spores find entrance through inhalation, and regulations adapted to stop this process certainly seem effective.

Spread of disease by direct inoculation, as in the diseases I have mentioned, is a very evident process and has long been recognised. The spread of cowpox from cow to cow and from the cow to the milkers' hands, and from these back to the cow is another illustration of how disease enters the body by inoculation.

But there is another and more insidious form of the transmission of disease by inoculation in which the carriers and introducers of disease are certain blood-sucking insects. During the last twenty years much has been learned of this method of spread, and now quite a long list of diseases are known to be carried and inoculated by insects. The spread of Texan cattle fever was long a puzzle to pathologists. Cattle from Texas passed north into the United States and showed no signs of disease. The cattle they came into contact with became infected and died. Gradually the disease advanced northwards and graziers noticed that all the affected animals were infested with ticks. That ticks had something to do with the disease became generally accepted, but their exact part in the process of infection was a mystery. In 1889 Smith and Kilborne acting for the Bureau of Animal Industry experimentally demonstrated the part played by the tick. They knew that the cause of the disease was an organism named, from its pear-shape, a pirosoma and that the Texan cattle might carry the organism in their blood, but show no definite symptoms of its existence. They experimented as follows. Five native cattle were placed with three South Carolina cattle from which all ticks had been carefully picked and they completely escaped infection. Two months later two of the native cattle were turned into a paddock with tick-infected Carolina cattle, and both were affected within a month. In a further experiment ticks from North Carolina were scattered over a sound pasture, four native cattle were turned in and three of them were soon affected. The disease was also produced in sound stock by placing on their skins the six-legged larvæ of the tick which had been hatched in glass vessels in the laboratory, showing that the infection could pass from the infected tick through the egg to the next generation. Of course the ticks do not manufacture the organism (piroplasma) which causes disease they become infected from diseased cattle and then pass it on to others. A similar microbe to that which causes Texan cattle fever is also the cause of redwater in cattle in this country, of a form of jaundice in dogs, and of equine biliary fever in South Africa. The pirosoma is a minute animal parasite found in the blood corpuscles.

Another set of diseases are due to an organism found floating in the blood, it is termed a trypanosome. The parasite was first discovered by Dr. Evans, an Army Veterinary Surgeon, in the blood of horses in India affeeted with surra. A similar organism gives rise to tsetse-fly disease in South Africa, to mal de caderas in the Argentine, and to dourine, a disease of horses once thought to have some analogy with syphilis. Dourine is spread through the genital organs of the mare or stallion, the other diseases by biting flies. "Horse-sickness," a most fatal disease in South Africa, is inoculable experimentally. The causal organism has not been discovered, probably on account of its extreme

minuteness. There is reason to believe that it is spread by a biting fly, but more research is required to prove this hypothesis.

Yellow fever, a fatal plague which often prevails among human beings in Central America, is a disease spread by a mosquito—the Stegomyia Fasciata. Although this is a human disease I cannot find an example which better shows that a full knowledge of how it spreads enables authorities to control and stamp it out. There was an outbreak in New Orleans in 1905 and the following account of how it was met is compiled from a lecture by Prof. Boyce delivered at a meeting of the Epidemiological Society. Notification was made compulsory and rigidly enforced. Every case was removed to an isolation hospital. The house it was taken from was fumigated with sulphur so as to ensure that no infected carriers—Stegomyia—were left alive. The patient was screened so that no fly could become infected from him. The hospital was screened at every opening so that no fly could get in or out. The Stegomyia was killed wherever seen, and its larval stage which was found in every pool or cistern was destroyed. Thus the passage of the causal microbe from infected to healthy was prevented and the disease effectively stopped.

Another human disease which has caused great loss and trouble in the East—The Plague—is due to a bacillus. Only recently has it been discovered how it was spread. It was recognised that rats had something to do with it, but the rats did not bite people, and the direct contagion between patients and attendants did not seem a great factor in its spread. Now it is discovered that fleas from infected rats will infect healthy rats, and it is almost certain that the flea is an important carrier of the disease, if it does not form the chief agent in its propagation.

The spread of disease is modified or qualified by many factors. War and trade facilitate spread. Every great war has been attended or followed by the spread of contagious diseases. The fact has been acknowledged for centuries, but the reason of it was generally misunderstood, and hardship with over-crowding were credited as the primary causes of the prevalence of disease. The truth is that animals for war are always collected hurriedly, odd cases of disease in a latent stage are brought together among healthy animals, and thus epizootics are introduced in surroundings favourable for dissemination. When the war ceases surplus stock has to be got rid of, and sales of these animals disperse contagion far and wide.

The Franco-German war spread glanders over both countries after the war was over. The Spanish-American war was followed by the sale of superfluous horses in many centres of the United States, and glanders spread over the whole continent. The South African war was another instance. We collected glanders in America and at home, we carried it to South Africa, where it spread, in face of real but belated efforts to control it, until the whole country was infected.

Trade, too, does its share in spreading disease. Pleuro-pneumonia was carried from Europe to America by trade, so was foot-and-mouth disease, and dourine. Tuberculosis has been carried from Europe to every country on the face of the earth which has imported cattle. Diseases of man are spread in the same way. Pilgrims to and from Mecca are constant carriers of cholera and plague. From the East, Europe has been more than once invaded by cholera and plague, whilst Europe returns the compliment by sending measles and small-pox in every direction. These disseminations of disease from one country to another, especially to distant spots where they were previously unknown, are marked by one striking peculiarity. Their virulency among a population where they were hitherto unknown is indefinitely increased. Measles, a comparatively harmless disease at home, was in Fiji almost universally fatal. Rinderpest, which prevails constantly on the Steppes of Russia, causes there a fatality of perhaps 25 per cent. Here it leaves hardly a recovery. In northern India its fatality reaches about 70 per cent.

Animal plagues have caused among human beings and among domestic and wild animals probably more loss of life than famine and war put together. They are preventible; and as His Majesty King Edward once said in regard to tuberculosis, "then why not prevented?" The answer is—because we do not yet know sufficient about them to warrant the attempt. When we know all about the methods of their spread we shall be in a position to frame regulations worthy of adoption. Each country will make its own laws, but some day it will be recognised that only international co-operation can achieve the full success that is possible. Meantime pathologists all the world over are working busily to find how disease is spread. They are enquiring into the life history and habits of the organisms which cause disease, and every year shows some advance, some new discovery which sheds further light on the way in which disease is caused and the method by which it is passed on from diseased to healthy animals. Very difficult are the problems which our Cosmopolitan bacteriologists are endeavouring to solve, and far more support should be given them by all countries than is now vouchsafed.

That "prevention is better than cure" everyone acknowledges in the abstract, but Governments are slow to give practical application to the proverbial saying. It would pay, and pay well, to endow research in the field of comparative pathology. Statesmen are slowly recognising the truth of this, and our Colonial Office has done well in helping the work of the Tropical Diseases Schools in London and Liverpool. Canada, the United States, South Africa, Australia and New Zealand have each established institutions and scientific staffs to enquire into the spread of disease in man and animals. Germany has sent Koch half over the world to investigate and advise, and in no instance without an ample return.

At home a new departure has recently been made with animal diseases, and the Board of Agriculture is systematically investigating swine-fever, anthrax, and contagious abortion, with results which are cer-

tain to lead to vast improvement. A Royal Commission has almost completed its labours on tuberculosis, and its report when issued will undoubtedly clear the way for effective legislation.

Legislation against disease is not to be looked upon as merely a penal act, which restricts our action, interferes with business, and provides fines and imprisonment for offences.

Legislation has proved itself an efficient educator concerning the diseases of animals, because it brings home to owners the necessity of looking after their stock and taking intelligent notice of all departures from health.

This country is an island and the sea prevents the introduction of disease except through what is carried on ships. Our insular position makes it possible to clear our stock of all contagious or infectious disease, and to guarantee other countries against the importation of disease from here with any animals we may export.

I am told that the most profitable part of agriculture now is the breeding of high class stock, and that for at least some generations to come we shall continue to supply all the world with pedigree animals calculated to grade upwards the stock of other nations. Surely such a trade would be less hampered and more profitable when it was known that no regulations against the importation of disease were necessary—that our stock was healthy and free from disease.

We have already stamped out cattle-plague, sheep-pox, pleuro-pneumonia, foot-and-mouth disease, and rabies. It is well within our power to rid our herds and studs of tuberculosis, glanders, swine-fever, and contagious abortion. It is a poor position to claim that we are better than others. Just a little more effort, individually and collectively, would enable us soon to make the proud boast—there is no contagious disease among the domestic animals of Great Britain and Ireland.

CLINICAL NOTES ON NAVICULAR DISEASE.

By Captain R. C. Cochrane, A.V.C.

Having had an opportunity of examining a number of horses which for one cause or another had been turned out to grass for many months, it may be interesting to recount the clinical features of the lame cases which were subsequently destroyed as incurable.

All these animals had the benefit of a long rest, and were under ideal conditions for the purpose of recovery, if such were possible.

On this point we lay stress, as it has been argued that a long rest, especially in navicular disease, is favourable to recovery, and though no one has ever had a recovery from undoubted navicular disease, we continue to carry out the accepted method of dealing with the affection, on the off chance that some good may result.

Sixteen horses were destroyed for what was regarded as navicular disease, and the opinion was confirmed at post-mortem examination.

None of these horses (except Case VII.) had an orthodox navicular foot, nor even contraction of the heels to any great extent, but that may be due to the fact that they were rested on marsh land.

Some of the cases were very lame, others only slightly so; accurate notes of the degree of lameness were kept, and the fact clearly established that in these sixteen horses the degree of lameness bore no relation to the pathological conditions present, it was possible for extensive disease of the bones to be attended by only moderate lameness. Unfortunately accurate notes were not kept of the condition of the bursa in every case.

Another feature never absent was the existence of the disease in *both fore feet.* In no case was one foot only affected—it was in both or neither, and those who are inclined to regard navicular disease as resulting from a bruise of the bursa, or other outside cause, would do well to bear the fact in mind, for it is hardly reasonable to suppose that both navicular bursæ could be bruised.

The photographs show how frequently the bones were enlarged, though not necessarily both bones. In the cases where one bone was larger than its fellow, such changes existed in the leg on which the horse was the lamest.

An important feature is the widespread nature of the lesions. In the majority of these cases, as the photographs will show, the bones were more or less affected from end to end.

I was impressed by the rarity of the lesions in the perforans tendon, yet it can be undoubtedly explained by the fact that these horses did no work for months; had they worked up to the end the tendons would have been affected—eroded.

In consequence of an article by M. Pecus, in *The Veterinary Journal* for May, 1906, p. 265, in which he classifies the disease as resembling dry arthritis in man, all the other joints of the limbs in each horse were examined post-mortem to see whether they showed any signs of affection, but they were all found healthy.

Only in three out of the sixteen cases was the perforans tendon adherent in places to the ulcers in the bones, as if repair were occurring, but such cases in life were very lame, and gave no reason to think they were any better than the others where no adhesion had occurred. I have thought it best to tabulate the results of my examination of these feet.

The numbers on the photographs correspond with the case number of each horse given in the table.

The photographs are most faithful reproduction of the original bones, and I am indebted for them to Mr. Toyne, late F.G.M.S., S.V.D.

Army Veterinary Corps.—At an examination for commissions as Lieutenants held at Aldershot on 22nd and 23rd January, the following candidates passed:—Messrs. Adam Hodgins, Hugh A. Stewart, Harry Bone, Graham B. C. Rees-Mogg, Howard C. Stewart, Thomas Lishman, Robert Tindle, and Spencer Black.

The following officers arrived from India in Transport "Plassy" on 25th January, and have been granted leave of absence to February 28th:—Captains A. E. Clarke, J. B. Southey, W. C. Lowe; and Lieutenant M. St. G. Glasse.

LIVERPOOL UNIVERSITY VETERINARY MEDICAL SOCIETY.

Recent Developments in the Treatment of Infectious Diseases, and their Application to the Treatment of Strangles and perhaps other Infectious Diseases of Animals.

By Prof. H. E. Annett, M.D., D.P.H.,
Liverpool University.

(*Continued from p. 471.*)

First the authors explained a careful technique by which it was possible to measure the phagocytic power of the white blood corpuscles. This consisted in measuring off in a capillary tube, equal parts of an appropriate suspension of a bacterial culture, and of blood freshly drawn and prevented from coagulating by the addition of an equal volume of a 1 per cent. solution of citrate of soda in physiological salt solution (0·85 per cent.) The mixture in the sealed tube was placed in a temperature of 37 C. (blood heat) for 15 minutes, and after that time examined microscopically by the method of smearing, fixing and staining on a glass slide. During the 15 minutes it was found that the phagocytes had engulfed a number of bacteria which could be easily counted in the microscopic specimen; the total number in several leucocytes, divided by the number of leucocytes counted gave an average per leucocyte which was called the "phagocytic index." The next step was to ascertain the *rôle* of the separate blood constituents in the phenomenon of phagocytosis, and this was done by collecting in a suitable vessel a small quantity of blood in a fluid which prevents its coagulation (such as the one already mentioned), and separating the corpuscles from the serum by sedimentation or centrifugalisation. From the sediment the white corpuscles, which collect above the red are easily obtained separately and then can be washed thoroughly to free them from all traces of blood serum. If now the details of the experiment already described be followed out again, using instead of the whole blood only the washed white corpuscles, it is found that the phagocytic power of the white corpuscles alone is now insignificant, and that it is only decidedly manifested when blood serum is added. Similarly no marked phagocytosis was obtained when the serum used has been previously heated to a temperature of 60 C. for 10 to 15 minutes.

Thus it was demonstrated that the blood serum contains substances which prepare the invading micro-organism for the attack of the phagocyte, and that without these substances the leucocytes are indifferent to the invading bacterium; and further, these substances in the blood serum are destroyed by a temperature of 60 C. acting for 10 to 15 minutes.

These substances so eminently essential to the phagocytic action of the leucocytes of the blood, it has been proved, do not act upon the leucocytes after the manner of a stimulant (Metchnikoff "stimulins") but they combine with the micro-organisms and prepare them for phagocytosis; hence Wright introduced the term "opsonins" for these newly discovered substances in the blood serum, (from *opsono*, I prepare victuals for). A simile may be given, the micro-organisms may be represented by a savoury dish set before an epicure—the leucocytes—who always take sauce—the opsonins of the blood serum—to prepare and improve his food for his fastidious palate and lethargic digestion.

Without this initial preparation by combination of the micro-organisms with the opsonins present in the blood fluids, phagocytosis cannot and does not proceed, no more than can the modern epicure eat his meat without the previous addition of sauce or relish. It would take us far too long to discuss the nature of these opsonic substances, it will suffice simply to point out that they are different from any of the other substances demonstrable in certain serums—antitoxic, bactericidal, bacteriolytic, agglutinating and others.

Table showing the Ratio in which the Phagocytic or Opsonic Power of the Patient's Blood stood in each case to the Phagocytic or Opsonic Power of the Normal Individual who furnished the Control Blood. (The Phagocytic Power of the Control Blood is taken in each case as unity).

Initials of Patients.	Form of Staphylococcus invasion.	Phagocytic or Opsonic index.
E. G.	Furunculosis	0·48
F. F.	Sycosis	0·49
J. E.	Acne	0.64
J. H.	Furunculosis	0·87
W. B.	Acne	0·55
E. H.	"	0·82
W. H.	Furunculosis	0·79
R. G.	"	0.7
G. L.	Acne or Sycosis	0·74
S. C.	Furunculosis	0·87
W. L.	"	0·88
W. P.	"	0·39
S. F.	Very aggravated Sycosis	0·1
E. F. D.	Acne	0·73
D. C.	Sycosis	0·8
J. M.	Acne	0·48
W. M.	Sycosis	0·37
E. P.	Acne	0·6
M. S.	Puscular affection of Lips	0·6
F. V.	Repeated Septic Infection	0·47

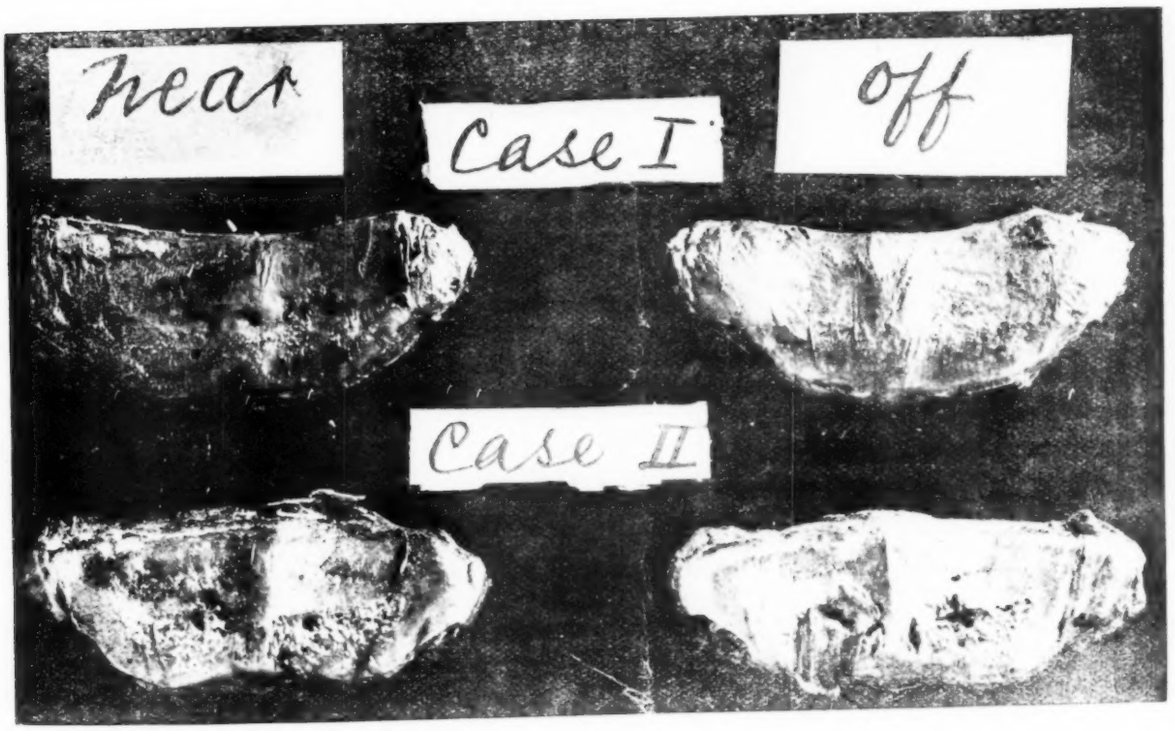
Table showing the tuberculo-opsonic Index in a Series of Cases of strictly localised Tuberculosis.

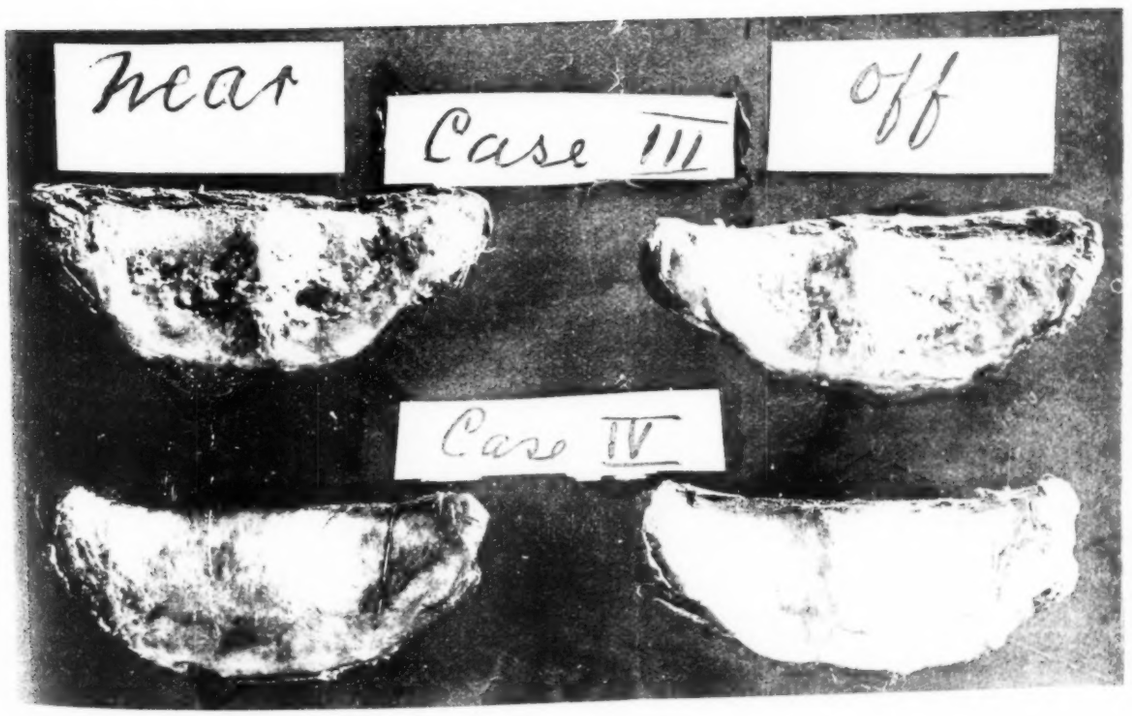
No.	Patients Initials.	Nature and Seat of Tubercular Infection	Tuberculo-opsonic Index.
1.	J. R.	Tubercle of testis	0·65
2.	A.	Caries, lower end of femur	0·7
3.	C. S.	Tubercular ulceration, dorsum of hand	0·86
4.	A. B.	iritis	0·51
5.	B. C.	glands	0·4
6.	E. M.	ulceration of legs (13 years duration)	0·17
7.	H. W.	glands (neck)	0·82
8.	D. W.	" "	0·64
9.	S.	ulceration of legs	0·49
10.	L. B.	glands (abdominal)	0·13
11.	B.	kidney	0·75
12.	M. H.	cystitis	0·85
13.	D. B.	glands, extirpated and reappeared	0·85
14.	M. O. E.	glands	0·6
15.	W.	Psoas abscess	0 75
16.	C. H.	" "	0·65
17.	W.	glands (neck) 18 months duration	0·47
18.	C.	wrist	0·85
19.	U. R.	glands (neck)	0·7
20.	A. H.	glands, extirpated and reappeared	0·54
21.	P.	peritonitis	0·6
22.	R.	abscesses and glands	0·6
23.	E.	Lupus	0·6
24.	R.	Tubercle of testis and bladder	0·72
25.	P.	Tubercular peritonitis	0·7
26.	H.	caries of fibula	0·6
27.	C.	Tubercle of kidney	0·88
28.	W.	Tubercular disease of knee	0·6
29.	T.	glands (neck) recurrence	0·66
30.	S.	ulcer of foot	0·49
31.	C.	disease of knee	0·75

Case Number	Age of Horse. Years.	Degree of lameness.	Limb on which lameness was shown or most pronounced.	Condition of tendon.	Cartilage of navicular bone bluish.	Cartilage eroded and rough.	Cartilage ulcerated.	Ulcer... way central...
I.	10	Severe	Both fore	Smooth and discoloured	No	Yes, both	Yes, near	Yes, near
II.	11	Marked in off, slight in near	off fore, very slight in near fore	Abraded and attached to off bone	No	Yes, both	Yes, both	Yes, ...
III.	9	Severe	Both fore	Abraded and attached to near bone	No	Yes, both	Yes, near	No ...
IV.	12	Marked	Off fore	Smooth and discoloured	Yes, both	No	No	No
V.	15	Very slight	Off fore	Smooth and discoloured	Yes, both	Yes. both	Yes, both	Yes, ...
VI.	6	Severe in off, very slight in near	Off fore	Smooth and very slightly discoloured	Yes, both	Yes, both	Yes, near	Yes, ...
VII.	12	Very severe.	Both fore	Slightly abraded and discoloured	Yes, both specially over central eminence	Yes, both	Yes, near	No ...
VIII.	9	Slight	Near fore	Rough and discoloured	Yes, both	Yes, near	Yes, near	Yes, ... con- ... een- ... nce.
IX.	8	Severe	Near fore	Normal appearance	Yes, both	Rough, both	No	No
X.	10	Slight	Near fore	Abraded, rough in both, attached to near fore	No	Yes, both	Yes, near	Yes, ...
XI.	6	Marked, but became sound after month's rest, but went lame again.	Near fore	Smooth and very slightly discoloured	Yes, both	Yes, near	No	No
XII.	6	Slight	Off fore	Smooth and discoloured	Yes, both	No	No	No
XIII.	12	Marked	Off fore	Smooth slightly discoloured	Yes, both	No	No	No
XIV.	9	Severe	Both fore	Slightly rough, discoloured	Yes, both	No	No	No
XV.	11	Very slight	Near fore	Normal appearance	Yes, both bones being extremely dark in colour	No	No	No
XVI.	10	Slight	Near fore	Slightly rough	Yes, both	No	Yes, near	No ... ear

ceration of tra...	Extent of ulceration.	Calcareous deposits on bone	Bones enlarged.	Edges of bone chipped.	Condition of feet.	Remarks.
s, near	2 spots size pin's head on near	Yes, both	No	No	Heels not contracted	Action short and pottering.
s, off	Size of millet seed in near, size of pea in off	Yes, both	Near slightly	No	Heels not contracted	At first lame on off fore for over a month, and then slightly lame on near.
No ear	Size of pea	Yes, both	No	No	Laminitic appearance, heels not contracted	Had a marked laminitic gait.
No	*nil*	Yes, both very slight	No	No	Off foot smaller than near, heels not contracted	Action short and pottering, pointed off fore.
es, off	Ridge ½in. on side of central eminence	Yes, both	No	No	Off foot smaller than near, heels not contracted	Pointed off fore.
es, n...	Size pin's head	Yes, both	Yes, off considerably	No	Laminitic appearance, soles slightly convex, heels not contracted	
No ear	Size of millet seed in near	Yes, both	No	Yes, near	Heels narrow and contracted	Only lame four months.
con- es, n... ven- ince,	Size of a pea in near	Yes, near extensive, off very slight	Yes, off considerably	No	Heels slightly contracted	
No	*nil*	Yes, both, worst in near	Yes, near slightly	No	Heels not contracted	
es, n...	Two holes size of small peas	Yes, both	Yes, near slightly	No	Heels very slightly contracted	
No	*nil*	Yes, much more extensive in near	Yes, wings of near considerably	No	Heels not contracted	This animal had also been treated for sprained tendons off fore. P.M. showed slight discolouration of flexor tendons midway between knee and foot.
No	*nil*	Yes, both	No	No	Heels not contracted	
No	*nil*	Yes in both, more extensive in off	Yes, off considerably	No	Heels not contracted	
No	*nil*	Yes, both, much worse in off	Yes, off considerably	No	Heels slightly contracted	Animal continually pointing, first one leg and then another.
No	*nil*	Yes, in both, worse in near	Yes, near	Yes, near	Heels contracted	
No ear	Size pin's head	Yes, both	No	Yes, near (two places)	Heels not contracted	

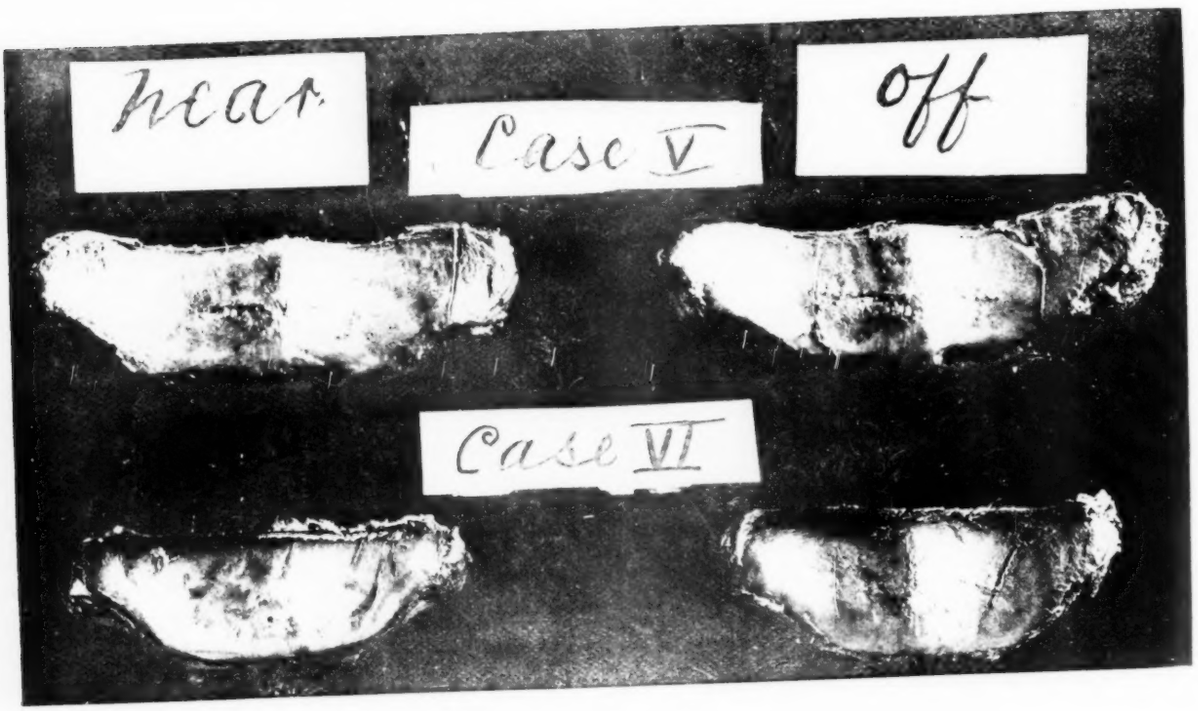
To face page 184.



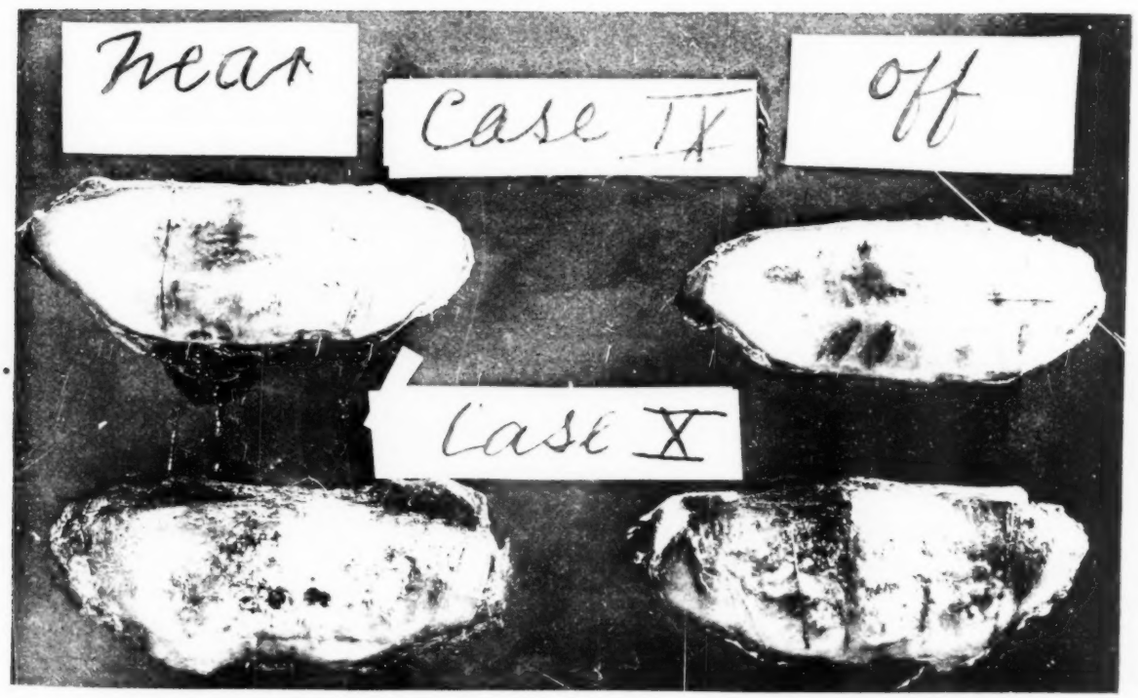


NAVICULAR DISEASE.

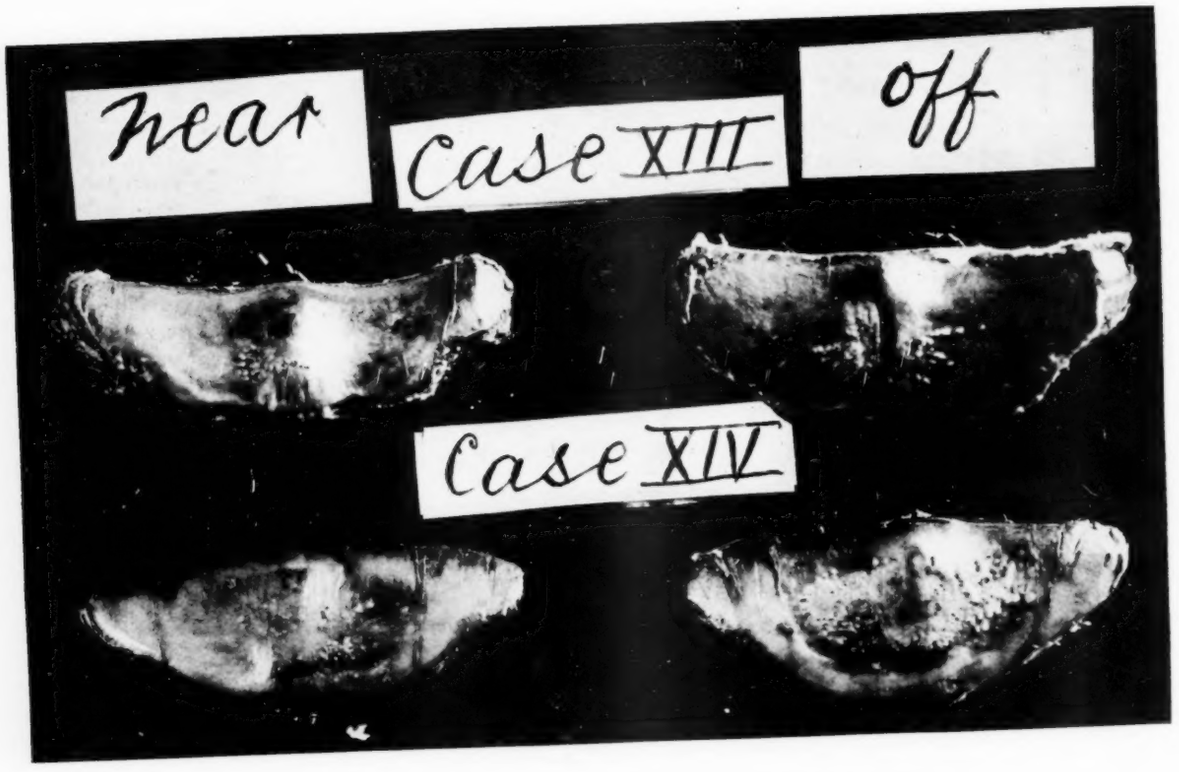
To illustrate Notes by Capt. R. Cecil Cochrane, p. 181.

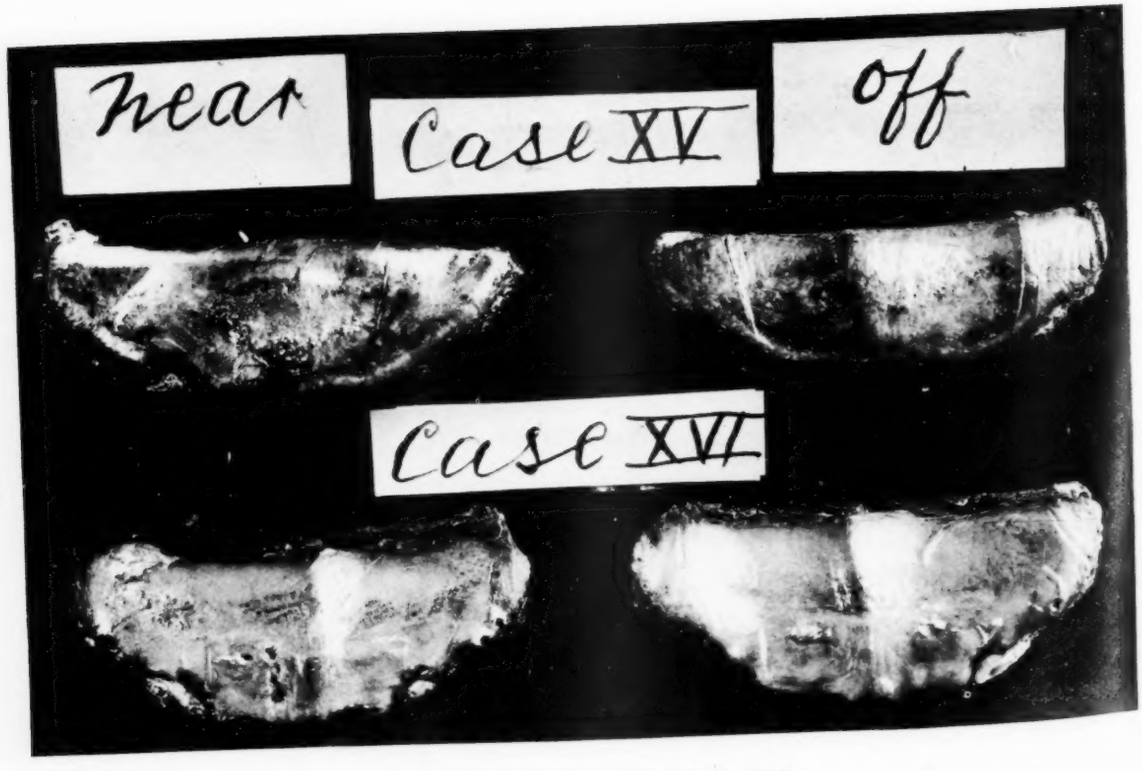


NAVICULAR DISEASE.



NAVICULAR DISEASE.



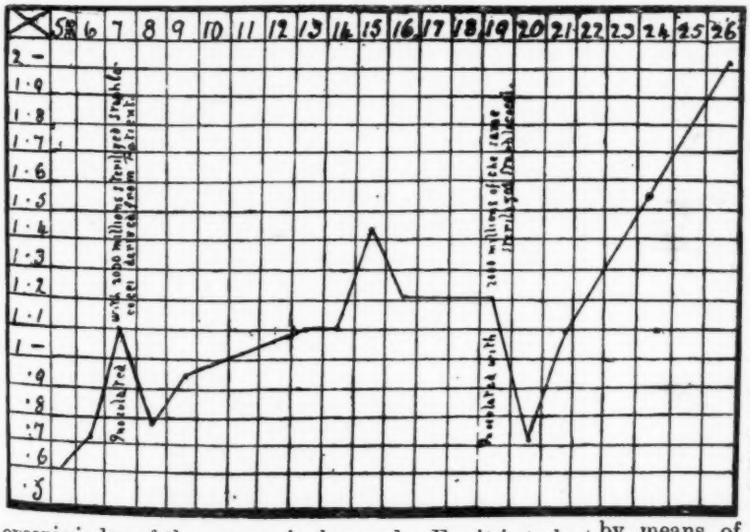


NAVICULAR DISEASE.

To illustrate Notes by Capt. R. Cecil Cochrane, p. 481.

Having thus established the existence of these bodies essential for phagocytosis, Wright and his colleague advanced a step further—*a most important one;* he investigated the opsonins in blood of several patients suffering from diseases, the causal agent of which are well known and easily recognised. For example, the serum of cases of acne, furunculosis, sycosis, etc. was tested as to its opsonic properties towards staphylococci, which are recognised as the cause of these affections; and similarly also cases of localised tuberculosis were similarly tested as regards the tubercle bacilli. It was found that the phagocytic index was, in practically every case, lower than in the case of a normal healthy individual, and sometimes the index was remarkably low. This is shown in the tables on preceding page.

This was the next step, and if you consider these figures awhile it will quickly become evident to you that since in each of these lists the index is lowered in every one of those different types of cases which have however the same organisms as their causal agent, that this method of determining the opsonic index of the serum may be used as a method of diagnosis. All one has to do is to test the properties of the serum of the suspected case against a number of the usual pathogenic disease-producing organisms to ascertain for which of them the



opsonic index of the serum is lowered. For it is to be remarked here that the opsonins of the blood serum are to a very large extent specific and although, for example, in a case of localised tuberculosis, the index is low when tested with the tubercle bacillus, the index as regards staphylococci may be normal. The opsonins are therefore specific, and this fact is evidently of very great importance in diagnosis. And this is the first of the two practical points to which I wish to draw the attention of the members of this Society—but the importance is insignificant when compared with the second.

It, however, occurs in the practice of every veterinary surgeon that obscure cases occur, the cause of which is suspected only; an estimation of the opsonic index of such a case would enable a decision to be arrived at.

At this stage I wish strongly to impress upon you the fundamental principle on which my discourse is based, namely, that the phagocytosis of invading bacteria by the white corpuscles of the blood is dependent on the quantity of the opsonins present in the blood serum, and from experience of the cases which I have quoted it becomes clear that the invasion and continued pathological action of certain pathogenic organisms in overcoming the defences of the host is possible only in consequence of a low opsonin content of the blood serum—and not on any abnormal condition of the leucocytes.

Having forced home this principle it is time to embark on the elucidation of my second and more important point.

Having found a lowered opsonic index in certain localised affections due to the invasion of definite causal bacterial agents, it necessarily followed that if by any means in these cases with lowered index some therapeutic measure were at hand by the use of which the index could be increased, such a measure would constitute a very powerful curative agent. The discovery of such agents and their application in the light of the information obtained experimentally by the estimation of the opsonic index of the blood serum, is the achievement of Prof. Wright, to whom the greatest credit is due. As far back as 1902 Wright treated cases of chronic boils, sycosis and other staphylococcal infections with small doses of staphylococcic vaccine by subcutaneous injections with very satisfactory clinical results. The vaccine consisted of a *killed* culture of the *staphylococcus pyogenes*, and contained a more or less definite and estimated number of organisms in each dose. After each dose the clinical condition of the treated cases improved remarkably, and it was also found that the opsonic index gradually rose. The more exact details of the effect of injections of such vaccine subcutaneously are illustrated on the chart.

The injection of the vaccine is generally followed by a period, of short duration usually (if the injected quantity has not been too great), during which the opsonic index is lower than before the injection and after this period the index gradually rises, and eventually becomes maintained at a higher level than before the injection. If now, and this is the proper opportunity, a second injection of the vaccine be administered in but very slightly increased quantity, a similar but shorter period of lowered index occurs, but not so long and not so low as on the previous occasion, and this is followed by a gradual rise to a still higher figure at which the index is eventually maintained, and so on. The period of lowered index immediately following the injection is called the negative phase, the period of the rise, the positive phase. The method of treating an infective disease by means of a vaccine is not new; I have only to remind you of the famous attempt by Prof. Koch to treat tuberculosis by means of tuberculin, which was really a killed vaccine: I also wish to remind you that such treatment when carefully and slowly carried out with small doses repeated and gradually increased only at considerable intervals was eminently successful in the hands of this great master and his pupils; but failed in the hands of many others. The explanation of the success of the few and the failure of many will soon appear much more clear to you—they depend on the occurrence of the negative and positive phases in the opsonic index after administration of vaccine, to which I have just referred. It will be clear to you that if the second injection of vaccine is given too quickly after the first and before the positive phase has become well advanced, a second negative phase will occur on top of the first and produce a still lower opsonic index, and so on. By reason of too frequent inoculations with excessive doses, it is almost certain that negative phase will be accumulated on negative phase until the resistance of the patient is so much lowered as to facilitate the rapid progress of the infection, until, indeed, the specific opsonins of the blood plasma are so greatly diminished in quantity that practically no phagocytosis by the defending white blood corpuscles can take place. And this is exactly what happened in the unsuccessful cases of

Koch's method for the treatment of tuberculosis; and nowadays the lack of that keen power of observation and careful habit of proceedure which is so characteristic of the Master Koch, is capable of being replaced, through the laborious and praiseworthy researches of Wright, by a method which permits the accurate observation scientifically of the effects of each injection.

The cardinal principle for treatment by vaccine laid down by Wright is "do not inoculate during the negative phase or you will further depress the machinery of immunisation, induce a low tide of opsonic power, and do harm. It is also inadvisable to reinoculate during the immediately succeeding reflow, because another negative phase will thereby be induced, but when the opsonic power has reached a fairly high level, and especially if it shows a tendency to recede, then it is advisable to inoculate. The next negative phase is not so marked as the first (provided that the dose of the second inoculation is not too excessive), while the rise to a high opsonic power is more rapid and better sustained.

And now, having almost at the end of my discourse, introduced my second important point I wish to give you a list of the affections of man which have yielded to therapeutic inoculation by appropriate vaccines—safeguarded by the estimation of the opsonic index—before I attempt to show in what direction these results can be applied to infections of the bones.

A. Due to staphylococcus pyogenes. 1. Furunculosis. 2. Pustular Acne. 3. Sycosis.
B. Due to pneumococcus of Fraenkel. 1. Empyema. 2. Cystitis. 3. Suppuration of the antrum.
C. Due to bacillus coli commune. 1. Cystitis. 2. Various local affections.
D. Due to gonococcus. 1. Gleet. 2. Gonorrhœal rheumatism. 3. Acute gonorrhea.
E. Due to B. tuberculosis.
   I. Strictly localised tuberculosis. 1. Lupus and tubercular ulceration of the skin. 2. disease of bones and joints. 3. cystitis, 4. nephritis. 5. epididymitis. 6. peritonitis. 7. adenitis. 8. laryngitis. 9. iritis.
   II. Not strictly localised tuberculosis. Pulmonary tuberculosis.

Now from the experience which has already been acquired in the treatment of the diseases included in this rather long and strikingly interesting list (details of treated cases of each specified disease would take much more time than either you or I can at present spare), very valuable instruction has already been obtained. And from a veterinary practitioner's point of view perhaps the most important is this: that among the diverse forms of disease mentioned, in some the negative phase is very short and even absent, while at the same time the positive phase and the receding of the tide subsequent to this phase are quickly established and well maintained. This is of vast importance, if this method of treatment by vaccines is to be adopted. But at the same time experience has already taught us that in other diseases the negative phase may be prolonged and that the 2nd injection must only be given with care and patience, and furthermore that the negative phase (unless very exaggerated) is but *very rarely* betrayed by an exaggeration in the condition of the local lesion, or by any change in the character of the temperature curve, or by any constitutional sign; while on the other hand the positive phase is accompanied by a marked improvement in the local lesion. From these considerations it will occur to you that there is therefore some possibility of being eventually able to treat cases empirically and without assistance of difficult bacteriological technique.

And now it remains for me only to point out how the opsonic index varies in cases of localised lesion and in cases of systemic infections.

In cases of strictly localised infections, due to any micro-organism the opsonic index is lowered, often markedly so, to that particular micro-organisms as compared with normal individuals not the subjects of bacterial infections. Normal individuals present a constant opsonic power to the various pathogenic bacteria. On the other hand subjects of systemic infection, *e.g.*, acute pulmonary tuberculosis, show often a high opsonic power, or an opsonic power which fluctuates from high to low. This fluctuating index is thought to be due to the repeated inoculation of the bacterial products into the system of the patient from his own focus of disease, and therefore the fluctuation corresponds to the negative and positive phases observed after artificial inoculation of vaccine. This fluctuation renders the application of this particular method very difficult, although with careful and numerous observations of the opsonic index the treatment has been in some cases successful.

And at last we now arrive at the question of the applicability of these results to the treatment of the diseases of the domesticated animals.

I have already pointed out the less important application of the subject to diagnosis in some obscure cases; but I wish to indicate as far as is at present possible some diseases which may be benefited by vaccine treatment safeguarded by observation of the opsonic power of the blood fluids. But at the same time I am perfectly aware that veterinary practice is not comparable in every respect with human practice, and that lines of treatment requiring the assistance of bacteriological technique are more or less easily carried out in human practice, but are at present almost impossible in veterinary practice, so that the field, except in cases of valuable animal patients, is somewhat less extensive than would at first sight appear. But it is to be expected, and already I have evidence pointing in that direction, that at least some of the localised infections of the domesticated animals may be capable of a more or less empirical but careful treatment with corresponding vaccine, in virtue of that absence of a marked negative phase after inoculation, to which I have already previously fully referred. In some cases it is hoped that the use of vaccines empirically will be followed by successful results in the majority of cases. Which of the localised infections are capable of being so treated will have to be carefully decided by resort, primarily, to the determination of the opsonic powers at intervals while under treatment.

As a few examples of infections which I think are likely to benefit by this line of treatment, I suggest the following:—

Localised infection of the skin by staphylococcus pyogenes—in horses, especially at sites where the harness rubs – such as acne, pustular dermatitis etc. Also certain cases of fistulous withers, poll evil, and similar affections.

Streptococcal infections, such as strangles, mastitis, and internal abscess formation in various sites.

Cystitis, pyelo-nephritis etc.

Chronic glanders and farcy.

Localised tubercular lesions in cattle.

Certain conditions following distemper in dogs etc. etc.

The method of precedure in such cases would be simple. From the lesion first one isolates the causal organism, and after cultivation the serum of the case is tested as to its opsonic power in respect to the micro-organism thus isolated. Then the inoculation of a small amount of a killed culture of this organism must be followed by further observations of the effect produced thereby on the opsonic index, and so on. And it will be necessary to go through the routine in veterinary cases before the bacteriologist will be able to decide which diseases can be treated empirically by vaccines without technical microscopical assistance.

It was my original intention not to bring this subject before the meeting of the Society until I was in a position to communicate definite results—but the difficulty in obtaining free access to likely cases has proved so great for one busily engaged in teaching and other duties that the number of cases which have been treated in this way up to the present is but few, but with the results so far I am exceedingly pleased.

And now finally I wish to refer to the very few cases of streptococcus infection which have been successfully treated by vaccine inoculations, and in which the opsonic index has been tested on two or three occasions. These cases have been placed at my disposal by Messrs. James and Henry Sumner, to whom I wish to tend my hearty thanks, and to Mr. Godber who very willingly has undertaken the major part of the work of estimating the opsonic index and of preparing the vaccine.

Report on Two Cases,

By Mr. J. B. Godber, M.R.C.V.S.

No. 1. This case was kindly placed at my disposal by Mr. Ludlow, M.R.C.V.S., Mansfield.

History. An aged brown gelding came in on Monday, July 22, with typical symptoms of strangles, temperature 104°F., hard swelling in the inter-maxillary space, œdema of the face and lips, slight discharge from nose. The animal received the usual treatment, the swelling pointed, burst and healed up in about a week. At the same time another abscess formed behind the angle of the jaw in the parotid region, and it was at this stage on Friday, Aug. 3, that the animal came under my observation.

Symptoms. Temp. 104·5°F., capricious appetite, dull, profuse discharge from nostrils. The swelling was hard with a soft spot near the centre. A few drops of blood were taken from the lips by means of a collecting capsule, and at the same time 2 c.c. of a killed culture of streptococcus pyogenes were injected subcutaneously behind the elbow. The opsonic index of blood, taking an average of 30 W.B.C., was found to be 4·5.

Thursday, Aug. 9. The improvement was very marked. The abscess had burst and almost disappeared, except for a small opening which was discharging very slightly, temp. 101·5, appetite much improved. A few drops of blood were taken as before and the opsonic index was found to have risen to 16·4.

Friday, Aug. 10. The wound had quite healed up, no swelling, only slight thickening due to formation of fibrous tissue. Temp. and appetite normal.

Monday, Aug. 13. The horse returned to work.

No. 2. Kindly placed at my disposal by Mr. Arnold Richardson, M.R.C.V.S., Liverpool.

Subject. Cow affected with mastitis in near hind quarter.

History. The case had been under treatment for about a week previous to coming under my observation.

Oct. 13. Temp. 105°F., dull, staring coat. Respirations increased, appetite poor. Affected quarter very much enlarged, hard and extremely painful to touch. Microscopic examination of the discharge revealed the presence of numerous streptococci. A few drops of blood were taken from the ear of the animal by means of a collecting capsule, and the opsonic index (taking an average of 30 W.B.C.) was found to be 3·6. The same day the patient received a subcutaneous inoculation of 2 c.c. of a killed culture of streptococcus pyogenes.

Oct. 17. The opsonic index taken as before had risen to 9·1. There was a slight general and local improvement, temp. 104°F.

Oct. 19. The case showed a marked improvement, temp. 101·5°F. Appetite normal. The affected quarter was greatly reduced in size, and painless to the touch. Opsonic index 10·5.

Oct. 27. Temperature and general condition of animal were normal. Opsonic index 12. The action of the causal bacteria had apparently been arrested, and the injury sustained by the normal gland tissue made good by the formation of fibrous tissue.

The treatment of this case by subcutaneous injections did not result in complete resolution. This could hardly be expected, owing to the gland having sustained irreparable damage before the case came under my observation. The action of the causal organisms was arrested much sooner than is the case where other methods are adopted; consequently the general condition of the animal was fairly well maintained, and the milk producing power very little impaired.

Mr. J. Wolstenholme: I have listened with intense pleasure to Dr. Annett's admirable paper on the opsonic theory and the possible application of a modified technique for the purposes of treatment of the lower animals. I have had the pleasure of listening to Prof. Wright on this subject, and of attending two demonstration; undoubtedly a great advance in scientific medicine has been made, so great that, to my mind, I can only liken it to Pasteur's work on putrefaction.

From the results already obtained by the method in the treatment of localised tuberculosis, it would appear that there was more than a grain of truth in Koch's estimation of the value of tuberculin as a curative agent.

Looking at the march of progress in medicine and surgery, it appears to me that the great lesson we veterinary surgeons should learn is the necessity for specialisation. Until quite recently we have been told over and over again that the teaching for the pass diploma, its examination, is sufficient for all possible purposes. It is excellent as a base, but certainly inadequate as a finished structure, and the more use we make of post-graduate study, and the greater emulation there is amongst our members to obtain University degrees, the greater will be the measure of our usefulness.

Mr. H. Sumner believed there was a great future in store in veterinary practice for this new kind of treatment, particularly in such diseases as strangles; but he was not so sanguine as to whether successful results would be achieved in such chronic affections as fistulous withers and like affections, which were so resistent to the present methods of treatment.

Mr. W. J. Fletcher had for some considerable time treated with success distemper in the dog by the injection of vaccine.

Mr. W. Woods spoke in eulogistic terms of the paper, and proposed a hearty vote of thanks to Prof. Annett which was enthusiastically received.

A vote of thanks to Mr. Godber was proposed by the Secretary, who remarked upon the interesting yet concise and accurate manner in which Mr. Godber had stated his cases.

Jno. T. Share-Jones, *Hon. Sec.*

NORTH OF IRELAND V.M.A.

An invitation was sent out to veterinary surgeons practising in North of Ireland to attend a meeting in Ye Old Castle Restaurant, Belfast, on Friday, Jan. 25. The object of the meeting was to revive the old North of Ireland V.M.A. The following veterinary surgeons attended: Messrs. R. Kernohan, J.P., Ballymena; James Lawther, S. R. Thompson, W. A. Botts, J. W. Peatt, F. R. M'Roberts, J. M'Aleer, John M'Barry, John Loughran, J.P., Ballygally; H. M'Connell, F. Russell, John P. Small, William Watson, R. W. Thompson, H. H. Carlisle, J. Ewing Johnston, A. M. Creighton, J. M'Lean, James S. Crooks, S. R. Tufts, T. T. Kilpatrick, J. George, James Gregg, J. J. Ross,

J. A. Thompson, and H. Gibson. Apologies were received from Messrs. Marks, Dawson, Orr, Stewart, and Dunlop.

Mr. J. A. Thompson, F.R.C.V.S., Lurgan, was moved to the Chair.

The CHAIRMAN briefly explained the object of the meeting, when Mr. A. M. CREIGHTON moved and Mr. J. J. Ross seconded, and Messrs. M'CONNELL and WATSON supported a resolution to revive the Association, and this, on being put to the meeting, was passed unanimously.

President. Mr. J. J. Ross was elected on the motion of Mr. Jas. Gregg, seconded by Mr. McLean.

Secretary. Mr. JAS. GREGG was elected on the motion of Mr. J. J. Ross, seconded by Mr. H. M'Connell.

Treasurer. Mr. J. A. THOMPSON was elected on the motion of Mr. W. Watson seconded by Mr. J. George.

It was arranged to call a meeting at an early date to draw up bye-laws and to put the Association on a business basis.

Immediately afterwards the members of the Public Health and Market Committees of the Belfast Corporation were admitted to the meeting, when a paper was read by Mr. H. GIBSON, B.A., M.R.C.V.S., on "Meat Inspection."

JAMES GREGG, *Secretary.*

(Mr. Gibson's paper will be printed next week.)

THE CENTRAL VETERINARY MEDICAL SOCIETY.

The ordinary monthly meeting was held at 10 Red Lion Square, W.C., on Thursday, January 10th, Major E. R. C. Butler, President, in the chair. There were present Messrs. G. H. Livesey, R. Porch, W. Roger Clarke, E. M. Perry, A. N. Foster, Prof. J. Macqueen, P. Woodroffe Hill, W. S. Mulvey, Capt J. J. Griffith, Nicholson Almond, J. McR. Frost, W. Perryman, L. Savournin, R. A. Philp, C. H. Harrison, R. J. Foreman, P. S. Howard, C. E. Wells, A. Neish, J. B Hare, F. G. Samson, J. B. Tutt, A. E. Gostling, A. L. Butters, James Rowe, E. Lionel Stroud, A. E. Bayley, W. L. Harrison, R. F. Wall, Herbert King, J. Willett, A. Rogerson, Major E. Taylor, Wm. Hunting, G. W. Bloxsome, Guy Sutton, A. Leese, Hugh A. MacCormack, hon. sec.; and as visitors Messrs. A. Cornish Bowden, L. A. H. Dawson, and Capt. W. A. Wood.

The minutes of the previous meeting were taken as read and confirmed.

A letter was reported from Mrs. Pritchard acknowledging a vote of condolence passed with her and her daughter on the death of Prof. W. Pritchard.

A letter was also received from the Hon. Secretary of the Lancashire Veterinary Association stating that the Association, after discussion on Major Butler's resolution *re* annual registration fee, were of opinion that an annual registration fee was inadvisable.

A letter was read from Mr. A. Routledge resigning his membership of the Society on his removal to Louth.

The Secretary was instructed to write to Mr. Routledge accepting his resignation with regret.

Letters and telegrams were received from Messrs. Sidney Villar, J. C. Coleman, S. H. Slocock, and R. P. Thomas regretting their inability to be present.

ELECTION AND NOMINATIONS.

Major A. C. NEWSOM, A.V.C., of Woolwich, was balloted for and unanimously elected a member of the Society.

Mr. G. H. KITCHIN, of Harrow-on-the-Hill, and Captain MARTIN MILLER, A.V.C., Weedon, Northamptonshire, were nominated for membership.

SPECIMENS.

Mr. G. H. LIVESEY exhibited several morbid specimens.

A cirrhotic liver from a fox terrier, aged 12 years. The dog only weighed 14lbs., and from nose to tail was not more than 20 inches long. He had had the dog for two years under observation. There had been a very remarkable murmur in the heart. When the dog died eventually from abdominal dropsy a post-mortem was made, and an aneurysmal sac was found to have been formed in the right and left valves. Dr. Bashford had seen the liver, but was of opinion that there was no growth. The liver was enormous for a dog of that size.

A pair of testicles of a small collie dog, one of the testicles being slightly smaller than normal, and the other a large cancerous mass. The testicle was situated in the inguinal region, and either had not descended into the scrotum, or through pressure had returned to the inguinal canal. Between the tunica vaginalis and the tunica propria there was about nine ounces of fluid. Dr. Bashford had taken a section for examination.

The intestines and liver of a cat aged two years and ten months. The animal had been unwell for some time, lying in front of the fire and purring. It would not feed or take much notice of anything. It gradually grew thinner. It was a Persian cat, and he was of opinion at first that in licking herself some of the hair had got lodged in the intestine, causing an obstruction. Clinical evidence showed that to be wrong, and on manipulating the abdomen he could distinctly feel a little cyst in the liver. The owner wished to keep the cat alive, and as it grew thinner it was possible to feel more clearly a lump in the centre of the abdomen. Eventually the cat was destroyed; a cystic liver was found and the intestines were knotted together like a bunch of worms. Lying close against the duodenum, in close proximity to the pancreas, was a large tumour, which on being cut had the appearance of cancer. Another growth was at the ileo-cæcal valve. The case also had been brought before Dr. Bashford, who had cut sections, and believed undoubtedly that it was cancer. The growth evidently originated in the membrane of the ileum and had infiltrated through the muscular coats until it penetrated and grew into the mesentery.

The brain and upper part of the spinal cord of a fox-terrier who suffered from peculiar spasms which affected the right fore leg and right side of the neck. Occasionally he appeared convulsed with pain, the head being bent downwards to the right and the right leg drawn up, but in about half a minute the paroxysm would pass. Gradually he lost power in both fore legs. The dog was destroyed and the brain and spinal cord removed, and old hæmorrhages were found on the dura mater of the spinal cord. The case was believed to be an early stage of chronic pachymeningitis.

An ascaris lodged in the cæcum of a puppy. The cæcum had evidently formed itself into a sort of "vermiform appendix," and was causing obstruction.

For another case Mr. Livesey was indebted to Mr. Harold Leeney, who, on the 13th December, saw a Scotch terrier under the following circumstances. The owner said that the dog had been out for a walk, and sudddenly on the way home started to gulp and shriek and give every evidence of something having stuck in his throat. A probang was passed, and there was immediate relief. Ten days later the dog did not seem very comfortable, the foreign body not having passed further than the stomach. A prompt emetic was given (one-tenth of a grain of apomorphine hypodermically) and the dog vomited the contents of his stomach, including five caudal bones, thought to belong to sheep. The dog improved, but a few days afterwards developed a peculiar diaphragmatic breathing. He was unable to retain solid food for more than a moment or so, but

lapped liquid food well. The bowels acted freely and there was apparently no obstruction. As time went on the stomach became dilated and the breathing became more and more laboured; the dog gradually got weaker and more emaciated. Two days ago, in consultation with Mr. Leeney, Mr. Livesey himself saw the dog and passed the probang and could distinctly feel that there was an obstruction a little in front of the diaphragm. It did not give the feeling of the grip of a sphincter, or of a rough foreign body. That, however, did not account for the intense dilatation of the stomach and duodenum, and he thought possibly another foreign body had become lodged further down the alimentary canal. It might, he thought. be a stricture or a band from localised peritonitis which was pressing on the bowel and causing obstruction. He suggested to the owner that he should put on the X rays and see if there was an obstruction in the œsophagus. This was done, and about an inch in front of the diaphragm something was observed and the œsophagus was distended to more than double the normal size. He could not locate anything in the bowel, but he was not satisfied there was nothing there, and exploratory laparotomy was performed. An incision was made a little to the right of the median line, about 1½in. in front of the penis and about 1½in. behind the sternum. He expected the duodenum would bulge out through the opening, but a large part of the stomach came out, and he had a great deal of difficulty in returning it. He passed his finger on to the pylorus and along the smaller bowel, but could find nothing to account for the condition. The spleen even came out once, showing that the organs were really displaced. The dog was destroyed and a post-mortem made. The bowel was found to be perfectly healthy, but in the œsophagus there was a large lump of bone, and a lot of fish skin and fish bones, all of which were putrid. Mr. Livesey exhibited a piece of the œsophagus, which was badly ulcerated, and said that undoubtedly in a few days the bone and putrid mass would have sloughed through into the chest and the dog would have died of septic pleurisy.

Mr. N. ALMOND exhibited a dog that had suffered from acute follicular mange. Before he saw the dog it had been treated for distemper. There was a certain amount of discharge from the eyes and the animal cried out when moved, and showed other peculiar symptoms. On the day he saw him the skin was to a large extent denuded of hair, and the eruption was more or less general. The animal was treated by a method which he did not think had been hitherto employed, and as it was attended by a very great amount of success it would be perhaps worth while calling attention to the facts. The agent employed was a solution of chloride of zinc. He took a scraping from the skin of the dog and found the parasite microscopically very readily. The owner thought that treatment would be too costly as the dog was not of much value, and asked him to take the dog away and destroy it, and he accordingly took it home for that purpose, but thought he would try what he could do before destroying the dog. He had been in the habit of using for such cases solid nitrate of silver, touching all the points with the nitrate in the morning and employing a mixture of paraffin and olive oil with a small amount of creosote in the evening, and under that treatment he had had cases recover in about six months. The treatment in the present case under chloride of zinc, however, had been followed by a far more rapid and complete recovery. The strength of the solution was half ounce of solid chloride of zinc to a pint of water, or 1½ ounces of Sir William Burnett's fluid diluted to fill an ordinary whisky bottle. It was applied by a small piece of sponge, very little solution being used, and the parts more affected were gone over again in the evening. According to Sir Lauder Brunton, the drug had no action on the unbroken skin, but was caustic, powerful, and characterised by the property of burning deeply; and Mitchell Bruce was of opinion that the action of zinc salts was generally closely allied to those of silver. If the success in the present case could be repeated a great many dogs would be spared, and the veterinary surgeon would be relieved of a great deal of trouble. To prevent animal licking himself after the application, keep him in motion till dry.

Mr. R. PORCH mentioned a case of intussusception of the cæcum. Such cases were very rare and should always be brought forward when met with. On the 8th instant about 8 p.m. a mare showed symptoms of colic. The ordinary treatment was adopted, and he did not see her until Sunday morning when she was still showing a little pain. Slight pains continued during the Sunday, and on the Monday she was apparently quite quiet. She was exhausted and the pulse was weak, and the breathing very shallow. She stood in a dejected, listless manner and could not be aroused. He gave her cardiac tonics, but nothing seemed to have any effect, and the pulse gradually got weaker until on Tuesday the 11th she died about 6 o'clock in the morning. He had diagnosed septic peritonitis. He made a post-mortem and found some muco-enteritis of both the small and large intestines, especially the former, but the cæcum had entirely disappeared. He then discovered that the cæcum was invaginated entirely into the colon, and on being cut out was found to be an inch to 1½ in. in thickness and shortened to about 16 in. On the first two days the mare passed fæces in the normal way, and a few hours before she died she commenced to purge violently, and continued to do so up to her death.

Mr. Porch also exhibited some specimens of teeth which had dropped out of a mare's jaw and been picked up in the stables. The mare was nine years old, and previously had dental trouble, her teeth being rough and uneven. She had been operated upon on two or three occasions. Three teeth were picked up in the manger, apparently having fallen quite clean out of the jaw.

Mr. J. B. HARE asked Mr. Livesey whether any treatment was adopted to prolong the dog's life in the case of cirrhosis of the liver. He himself had a similar case about 15 years ago in a valuable dachshund. He was called at night to see the dog with dropsy of the abdomen. The owner was most anxious to keep the animal alive as he had taken many prizes. On the following day he tapped the dog and drew off a washing basin full of fluid, and the animal very much improved and went on extremely well for a fortnight, when the condition again returned. The operation was repeated and went on at intervals for about six months, and then the dog went three months without requiring any operation. A few weeks afterwards he was called hurriedly, and found the dog dead. The post-mortem showed the liver to be not half the size of the liver of Mr. Livesey's specimen, but very hard and cirrhosed. During the time of the illness the dog was used for stud purposes, and the health of the dog was such that he could catch a rabbit.

Mr. LIVESEY said the owner of the dog would not hear of anything in the way of surgery and the only treatment he adopted was the continued use of a saline purgative, with occasional doses of calomel, and sometimes the animal was given a little liver pill of the usual character. He derived most benefit from small doses of sulphate of magnesia and nitrate of potash. Occasionally he was given carbonate of soda with his food, and his diet was restricted as far as possible to meat and milk, and large quantities of water. Undoubtedly dogs did improve by continual tapping, although he had not been so successful as Mr. Hare had been, as he never had had one absolutely cured.

(To be continued.)

DISEASES OF ANIMALS ACTS 1894 TO 1903. SUMMARY OF RETURNS.

Period.	Anthrax.		Foot-and-Mouth Disease.		Glanders (including Farcy)		Rabies. Cases Confirmed.		Sheep Scab.	Swine Fever.	
	Out-breaks	Ani-mals.	Out-breaks	Ani-mals.	Out-breaks	Ani-mals.	Dogs.	Other	Out-breaks	Out-breaks.	Slaugh-tered *
Gt. BRITAIN. Week ended Jan. 26	15	15			22	47			36	40	174
Corresponding week in 1906 ..	22	36			27	47			23	18	87
Corresponding week in 1905 ..	21	35			20	43			38	8	42
Corresponding week in 1904 ..	24	34			30	53			117	33	237
Total for 4 weeks, 1906	72	105			78	146			145	147	607
Corresponding period in 1906 ..	70	95			110	186			96	73	310
Corresponding period in 1905 ..	86	153			99	172			203	47	170
Corresponding period in 1904 ..	83	106			102	219			412	122	714
Board of Agriculture and Fisheries, Jan. 29. 1907.											
IRELAND. Week ended Jan. 19	..	..	..	..	..	..	..	..	14	5	50
Corresponding Week in 1906 ..	..	..	..	..	1	2	..	..	22	1	14
Corresponding Week in 1905 ..	..	..	..	..	1	3	..	..	17	2	12
Corresponding Week in 1904 ..	..	..	..	..	..	..	..	..	5	3	15
Total for 3 weeks, 1907	..	..	..	..	..	..	..	..	39	11	83
Corresponding period in 1906 ..	..	..	..	..	1	4	..	..	50	1	14
Corresponding period in 1905 ..	..	..	..	..	2	4	..	..	60	4	14
Corresponding period in 1904 ..	..	..	..	..	1	1	..	..	58	9	172

Department of Agriculture and Technical Instruction for Ireland, (Veterinary Branch), Dublin, Jan. 24, 1907.

NOTE.—The figures for the Current Year are approximate only. * As Diseased or Exposed to Infection

IMPORTATION OF HORSES, ASSES AND MULES (IRELAND) ORDER OF 1907.

The Department of Agriculture and Technical Instruction for Ireland have made a further Order under the Diseases of Animals Acts entitled the "Importation of Horses, Asses, and Mules (Ireland) Order of 1907." The Regulations in this Order, which will come into operation on 21st February, 1907, will, from that date inclusive, supersede those at present in force respecting the importation into Ireland of horses, asses, and mules from Great Britain, the Isle of Man, and the Channel Islands.

As a result of this change, animals of these classes—which, at present, may be imported on the production of a Veterinary Certificate and a Declaration from their owner that the animals have not been exposed to infection—will be required to be accompanied by a Permit from the Department before their importation can be effected; and the importation will be subject in each instance to such conditions as may be prescribed in the Permit.

Persons seeking Permits should make timely application in the matter to the Department so that a sufficient interval may be allowed in all cases for any enquiries that may be considered necessary.

The alteration of procedure thus outlined has been deemed advisable, as experience has shown that Declarations under the existing Regulations are often regarded by persons making them as mere matters of form, and, where this is the case, the Declaration can be of little value as a guarantee that the animal proposed to be imported has not been exposed to infection.

The procedure prescribed by the new Order will, it is anticipated, afford an additional precaution against the introduction into this country of cases of contagious disease in horses such as Glanders or Farcy.

Any person desiring a copy of the new Order can obtain such by applying to—The Secretary, Department of Agriculture and Technical Instruction for Ireland, (Veterinary Branch), Dublin.

The XIVth International Congress of Hygiene and Demography, Berlin, 23rd—29th Sep., 1907

The preparatory work is now well in hand. The subjects for discussion in the different Sections are fixed, the reporters are elected and invited. The selection of the reporters has been made in such a manner that the different questions may be treated on a wide basis. Most of the German reporters and many of the foreign reporters have already accepted.

All papers and information referring to the Congress are obtainable at the Office of the Congress, Berlin 9 W., Eichhornstr, 9, on application to

Dr. NIETNER, *Gen. Sec.*

Veterinary Dispensaries in Ireland.

At a meeting of the County Kildare Agricultural Committee, held in the County Council Chambers of the Naas Courthouse on Saturday, Jan. 19th, Mr. S. J. Brown, J.P., Chairman, presiding, the resolution from the Queen's County Committee *re* the procuring of veterinary assistance for the poorer classes came up for consideration.

The Chairman said the matter had been adjourned from last meeting.

Mr. Heydon: It would take an enormous lot of money to carry that scheme through.

Mr. Healy: There is no necessity for any such thing.

The scheme was not approved of. *The Nationalist and Leinster Times.*

Typhoid Tracked.

To the Editor of The Daily Mail.

Sir,—May I utter a warning to your readers who may suffer from the depredations of rats and the desire to destroy the vermin? How they should do the latter I will not venture to affirm, but do not use poison. A dear friend of mine is at present suffering from a, happily, mild attack of diphtheria.

Immediately on my arrival I sought the cause. My host stated he had been poisoning rats, so, with the aid of a keen sense of smell and pickaxe, I located three dead rodents within a yard of the bed in which my friend was wont to sleep before becoming ill. A defective wainscoting allowed an easy egress for the deadly odours due to putrefaction. MEDICO.

Personal.

WOLSEY.—On the 22nd January, at Leighcliffe, 74, Streathbourne Road, Balham, S.W., the wife of Thomas Wolsey, M.R.C.V.S., of a son.

ARMY VETERINARY SERVICE.

Extract from *London Gazette.*

WAR OFFICE, WHITEHALL, Jan. 29.

VOLUNTEER CORPS.—Infantry Battalions.—1st Middlesex (Victoria and St. George's) Volunteer Rifle Corps. Lieut. (Hon. Vet.-Lieut. in the Army) W. S. Mulvey to be Captain.

OBITUARY.

WILLIAM ALFRED SOUTH, F.R.C.V.S., late of New Bond Street.

Graduated, Lond: April, 1878.

Amid many manifestations of sorrow and regret the funeral took place on Thursday of Mr. William Alfred South, F.R.C.V.S., of 26, Clarges Street, W., and late of 40, New Bond Street, where with his father they had been established over 70 years. Deceased, who was well known and highly regarded by a large circle of acquaintances, succumbed to a short illness on Sunday last at the age of 58. An adept in his profession he made the diseases of the horse's foot an especial study, and invented the "Rational" shoe (a modification of the "Charlier" shoe) and for which he won several gold and silver medals. He was further greatly interested in æronautics and had spent a deal of time and money on their development. A member of the Æronautic Society, of the Japanese Society, a Mason of the Alexandra Palace Lodge 1541, and the founder of the Neasden Golf Club, he had not been altogether idle during his short career, and he will be sadly missed. The remains were laid to rest in the family grave at Paddington Cemetery, a large assembly being present. The floral tributes were very handsome and numerous.

CORRESPONDENCE.

THE PRESENT INFLUENZA EPIDEMIC AMONGST DOGS.

Sir,

"Canis," in your issue of the 25th January, writing under the above heading, expresses his inability to differentiate between canine influenza and canine distemper, and concludes his letter with the following paragraph: "I have written this letter with the object of drawing attention to this subject and to see if some abler mind than mine can define canine influenza in contra-distinction to canine distemper."

As I do not know who "Canis" is, I must disclaim any pretentions to possessing an abler mind than his, and I write at the disadvantage of not having read the views of the "acknowledged leader of the profession" in the *Illustrated Kennel News*, but as a common or garden member of the profession who gets a fair share of canine practice, I must confess to having diagnosed canine influenza, and propose here to set forth my views of the disease as opposed to distemper.

In influenza the sudden nature of the attack is a noticeable distinction—dogs have been observed in perfect health in the morning and manifestly ill in the afternoon—the first symptoms usually being stiffness across the loins and hind quarters. In distemper we get a longer period of incubation, a sickening for the disease, the patient getting thin, showing a slight cough, and rise in temperature. I have noticed in many cases of influenza that the temperature does not rise at all, being normal at the commencement of the attack and gradually sinking to 97° or less. In other cases I find an elevation of the temperature. This is puzzling, and I do not attempt to explain it, but I have observed that the cases with the sub-normal temperature are the most fatal. In influenza the conjunctivæ are injected, but there is an absence of the catarrhal discharges from the eyes and nose that we find in distemper.

In influenza, fatal cases turn to gastritis and enteritis. I have had no lung trouble except in one case which got wet, and I have seen no nervous sequelæ as chorea or paralysis. The duration of the attack in influenza is short, recovery or death taking place in a fortnight.

In influenza we get dogs of all ages attacked. I am treating one at present 16 years old, and it is interesting to note with regard to this case that he has been sleeping in the same bed as his owner while the latter was suffering from influenza; this, of course, may be a mere coincidence.

The epidemic nature of the disease should also be considered, large numbers being attacked about the same time, this lasting for a period of about two months and then gradually dying out, the form of the disease becoming milder meanwhile.

There are other noticeable features, but I think I have mentioned sufficient to differentiate between the two diseases. It is possible that "Canis" has not had to deal with the disease at all, which would account for his scepticism on the subject.—Yours faithfully,

Parkstone, Jan. 29. J. STEWART WOOD.

"THE LINCOLNSHIRE VETERINARY MEDICAL SOCIETY."

Sir,

The remarks which fell from the lips of the President of the Lincolnshire Veterinary Medical Society at their last meeting at Lincoln point to a very deplorable state of apathy which must exist among the members of that body. To think that there are thirty-two in number, apart from Honorary Associates, and yet only ten present at the gathering on the 18th October last. The President intimated that several members had been asked to contribute a paper and had replied that "they had no time," this answer may or may not be correct. There are names in the list of members whose voices have not yet been heard at any of the meetings, and probably never will, more the pity. For it is not only what they miss themselves, but think of the amount of practical and useful results of their own exper-

ience that they deprive others from knowing and reaping the benefit. Is all this really from want of time, or knowledge and capability, or is it from a reluctance to learn. It may be that they are selfish, and are under the mistaken idea they have acquired all the knowledge requisite to carry on a successful and remunerative practice. Not as up-to-date scientific men, but as past masters in the art of getting all there is to get by any means except the legitimate one, and ignoring everything which is at all related to etiquette and consideration for others. I know a veterinary surgeon who actually trades in Soothing Syrup for infants, and have heard the wife of one of his patrons recommend it to her lady friend by suggesting that "had it not been for our vet's mixture I do not know what we should have done with the children." Quackery is as rife with some of the qualified as it is with the quack, but there is only one difference, with the latter it is done openly, with the former it is done covertly. The "live and let live" motto seems to be lost sight of, and supplemented by another up to date, caring not who sinks so long as they swim. There is no desire of this class to emerge from the antediluvian mould of "cow doctor," they burlesque the diploma, and retard the social and intellectual progress of the profession, they resemble the inefficient member of another profession whose practice was deadly and whose post-mortems were lamentable. Major Butler said at the meeting of the Central Veterinary Society "that the aim of these Societies was discussion etc. and by that discussion they hoped to gain knowledge for themselves, broaden their views by learning from other men's opinions, and get out of the narrow dogmatic groove called experience. This generally covers a profound ignorance and certainly a narrowness of mind."

These very appropriate and well chosen remarks of Major Butler are very true and apply to numbers of our profession, who pride themselves in the stay at home principle. One may conjecture what can be their reason for hiding their light under a bushel. Perhaps it is that they are abashed in an assembly of veterinarians, or they are afraid that their knowledge, or deficiency of it, might be exposed to their colleagues. Again, it probably may be when they left their Alma Mater with the coveted diploma they had proved to the public that they were qualified, and the efforts entailed so much mental strain that the brain since that ordeal has ceased for ever to desire or acquire any further knowledge. The profound ignorance and self-satisfaction of some of these are appalling; a short time ago I heard from an up-to-date assistant conversing with his Principal about a patient suffering from azoturia, and in conversation the assistant mentioned the toxœmia being expended etc. Well, this word toxœmia so delighted the Principal that for days after everything he met had to be christened with the new addition to the limited vocabulary of terms, but it helped still further to increase the gullibility of the unwary patrons, who still marvel at the vast experience of their ideal "Knight of the Castrating Clam" or "Obsolete Professor of a fossilised type."

The hall-mark of empiricism is indelibly printed and characteristically manifest by the general action of many of our order, as may be seen, by the most brutal treatment of chest affections, poll-evil, and the application of blemishing blisters to the shoulders of a horse when lameness exists in the foot!

One or two illustrations only are needed to prove the necessity of going from home, and exchanging ideas honorably and socially with others, many of which are to be found in those who are not only capable but are willing to teach, by truthful records of their observations in the daily routine of general practice:

No. 1, 1906. Lameness having existed somewhere in the hind leg of a horse for a period of six months or more, various methods of treatment having been adopted without avail, when finally it was resolved that a blister should be applied to the fetlock joint. The owner asked the reason, when the man of science replied, "There is jelly in the cup, which I want the blister to draw out." Sublime ignorance!

No. 2. A cob, examined and certified sound, purchased, taken possession of, and clipped the same day. The following morning lame. Another veterinary surgeon was then called in and found lameness due to a splint, which examiner No. 1 had missed; he did not own having done so, but sought to hide his ignorance by his erroneous theory that the cob was lame from atrophy of shoulder muscles, which he could not possibly have noticed before the animal was clipped. All this was too far-fetched for the purchaser, who was a medical man, so he threatened litigation, with the result that the cob was taken back and proceedings stayed.

A sporting gentleman told this story of his experience at a dinner. He sent a vet. to examine a hunter and certify result, which was satisfactory, so the purchase was completed, horse sent in and ridden by new owner, who had certain suspicions which led him to see Mr.—, F.R.C.V.S., and ask him if he had not made a mistake; the sapient F.R.C.V.S. indignantly replied, "Indeed, no, I examined microscopically." The microscopic victim was casually examined by several other members of the profession a few days afterwards, certified a "whistler," and unsound from spavin; these defects were discovered without the aid of any mysterious instruments. This is the first time in my experience that I have heard of the microscopic examination of a horse as to soundness, and I most humbly suggest that if that F.R.C.V.S. survived the ignominy of his microscopic failure, and is still among us within easy reach, would he graciously volunteer a paper for the Grantham meeting on "The differentiation of vocal sounds emitted by animals, beings, and things in different stages of exertion microscopically or otherwise?" Failing this, perhaps we might get the proprietor of the "Traction Jelly Blister" to give a brief outline of the *modus operandi* of this new venture, or the component parts of his "Infants' Mixture," because something might be made out of it as a proprietary article, as a bust improver, or a reducer of swollen head. The component parts of "Infants' mixture" with copies of testimonials and the methods of preparation, given to the members of the Lincolnshire Veterinary Medical Association could not fail to attract all old members to the annual, and instil a burning desire in all non-members to augment the list.

Such obtusely qualified practitioners possess the optimistic brain and temperament as regards their own capabilities. Not only is their ignorance bliss, but the pity of it, they are ignorant of their own ignorance, moreover they are content to remain in that stationary, if happy, and quiescent state.

"Vincit Veritas."

ADVERTISING.

Sir,

Allow me, through the medium of your valuable journal, to emphatically deny that I, by any influence or in any other way, procured the publishing of the "highly coloured" paragraphs, of which a copy appeared in your last issue; furthermore, I am not aware that I stand in need of any such advertisement. If your correspondent will take the trouble to enquire at the Editorial Office of the paper in which the paragraph appeared, he can verify this assertion. —Thanking you in anticipation, I am, dear sir, faithfully yours,

F. Wainwright Anderton, F.R.C.V.S.

41, Manningham Lane, Bradford,
January, 26th.

Text Book of Comparative General Pathology for Practitioners and Students of Veterinary Medicine, by Prof. Dr. Th. Kitt, of Munich. Authorised translation by Dr. William W Cadbury, Asst. Demonstrator of Pathology, Univ. of Pennsylvania. Edited with notes and additional illustrations by Dr. Allen J. Smith, Prof. of Pathology, Univ. of Penn. Ryl. 8vo., cloth, lettd. pp, xv + 472 and 4 coloured plates. 131 illustrations in text. 25/- net. Balliere, Tindall & Cox, Henrietta Street, W.C.

Communications and Papers received—Messrs. G. Upton, W. Drewitt, J. Gregg, J. W. Anderton, A. H. Darwell, W. J. Young, E. Nettleship, J. S. Wood, Clement Baxter, H. Taylor, "Vincit Veritas," F.E.P.

The North British Agriculturist, The Drogheda Sentinel, The Bournemouth Daily Echo, The Belfast News Letter, The Midland Evening News, The Nationalist and Leinster Times.